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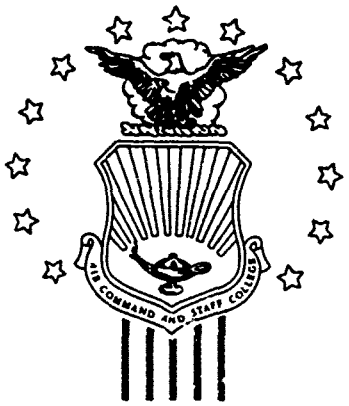

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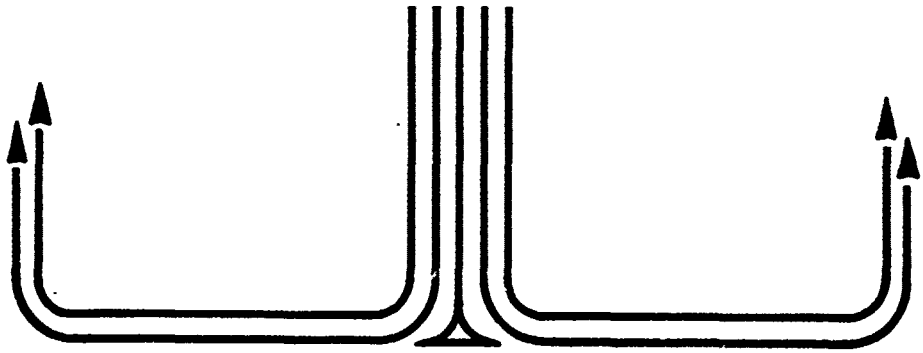
STUDENT REPORT

THE ICBM MODERNIZATION BRIEFER'S HANDBOOK

MAJOR STEPHEN R. GARCIA 88-1010

"insights into tomorrow"



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REPORT NUMBER 88-1010

TITLE THE ICBM MODERNIZATION BRIEFER'S HANDBOOK

AUTHOR(S) MAJOR STEPHEN R. GARCIA, USAF
MAJOR TERRILL L. KEMP, USAF

FACULTY ADVISOR MAJOR MICHAEL C. MCMULLIN, ACSC
3824 STUS/SEMINAR 37

SPONSOR COLONEL CHRISTOPHER I. BRANCH, HQ SAC/XPQ

Submitted to the faculty in partial fulfillment of requirements for graduation.

AIR COMMAND AND STAFF COLLEGE
AIR UNIVERSITY
MAXWELL AFB, AL 36112-5542

UNCLASSIFIED
SECURITY CLASSIFICATION OF THIS PAGE A194364

REPORT DOCUMENTATION PAGE

Form Approved OMB No. 0704-01

1a. REPORT SECURITY CLASSIFICATION UNCLASSIFIED	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT STATEMENT "A" Approved for public release; Distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S) 88-1010	5. MONITORING ORGANIZATION REPORT NUMBER(S)
6a. NAME OF PERFORMING ORGANIZATION ACSC/EDC 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION
6c. ADDRESS (City, State, and ZIP Code) MAXWELL AFB, AL 36112-5542	7b. ADDRESS (City, State, and ZIP Code)
8a. NAME OF FUNDING/SPONSORING ORGANIZATION 8b. OFFICE SYMBOL (If applicable)	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER
8c. ADDRESS (City, State, and ZIP Code)	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO / PROJECT NO. / TASK NO / WORK UNIT ACCESSION

11. TITLE (Include Security Classification)
ICBM MODERNIZATION BRIEFER'S HANDBOOK

12. PERSONAL AUTHOR(S)
GARCIA, STEPHEN R., MAJOR, USAF; KEMP, TERRILL L. MAJOR, USAF

13a. TYPE OF REPORT	13b. TIME COVERED FROM _____ TO _____	14. DATE OF REPORT (Year, Month, Day) 88 April	15. PAGE COUNT

16. SUPPLEMENTARY NOTATION

17. COSATI CODES			18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
FIELD	GROUP	SUB-GROUP	This handbook

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The ICBM Modernization Briefer's Handbook is a guide to assist requirements officers at HQ SAC/XPQ as they present this briefing to the public. It contains information on the history of ICBMs, evolution of national defense strategy, arms control, the various basing modes proposed for MX-Peacekeeper, and the rationale for deploying Peacekeeper Rail Garrison and Small ICBMs in Hard Mobile Launchers. Intended to help new briefing officers broaden their knowledge of the historical perspective of ICBM modernization.

This

Keywords: Launching sites; Guided missile launchers; Public relations; Surface to surface missiles; Strategic weapons.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT	21. ABSTRACT SECURITY CLASSIFICATION
☐ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	UNCLASSIFIED
22a. NAME OF RESPONSIBLE INDIVIDUAL ACSC/EDC MAXWELL AFB, AL 36112-5542	22b. TELEPHONE (Include Area Code) (205) 293-2867 / 22c. OFFICE SYMBOL

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POSITION PAPER

ON

THE NEED FOR THE ICBM MODERNIZATION BRIEFER'S HANDBOOK

1. The purpose of this paper is to examine the need to produce a handbook (Atch 2) to help new briefing officers assigned to the Headquarters SAC Directorate of Intercontinental Ballistic Missile (ICBM) Requirements (XPQ). XPQ is sponsoring development of the handbook (see Atch 1). As its name implies, the handbook is designed to provide information that complements material presented in The ICBM Modernization Briefing. This briefing is the "centerpiece briefing presented to all distinguished visitors" (see Atch 1) to inform them about the need for ICBM modernization and specifically reviews the Peacekeeper (formerly "MX"--for "Missile Experimental") and Small ICBM (sometimes referred to unofficially as "Midgetman") programs. The purpose of the handbook is to provide information to new briefers to help them more fully appreciate some of the concepts and historical background of the ICBM modernization program "to enhance [their] ability to convincingly articulate command requirements" (see Atch 1). This paper will examine the following areas that frame the need for a handbook: the requirement to present The ICBM Modernization Briefing to many diverse audiences; the need to be able to confidently and credibly respond to questions generated by presenting the briefing to those diverse audiences; and the secondary impact of improving a briefer's leadership potential by increasing his professional knowledge. The paper will conclude with a look at what is in each chapter of the handbook and why it was selected.

2. Advocating Peacekeeper and Small ICBM program requirements is one of the primary functions of XPQ's Advanced Missile Development Division (XPQM) (16:47), and the handbook is designed to enhance the division's effectiveness in accomplishing that function. One of the primary methods of advocating Peacekeeper follow-on basing and Small ICBM requirements to the public is presenting The ICBM Modernization Briefing. The briefing emphasizes the Peacekeeper and Small ICBM programs because "[they] have become the centerpiece of our ICBM modernization program" (7:25). The Director of ICBM Requirements selects captains and junior majors from XPQM to present the briefing because

they work with the Peacekeeper Rail Garrison and Small ICBM programs on a daily basis and have the most current knowledge about program developments and operations concepts. When selected, the only training provided to a new briefer is observation of other briefers during their presentations, taking notes and studying their presentation methodology, and practicing. The amount of time required to complete this preparation is dependent upon a briefer's knowledge, experience, and opportunity to observe other briefer's during their presentations. Since two-thirds of the briefing presents current program requirements, a new briefer can quickly develop confidence in these areas. However, there are several other aspects of the briefing that a briefer must develop on his own without the benefit of any training. The greatest challenge in this area is preparing for the post-briefing question and answer period. Developing confidence to handle the questions posed by diverse audiences is one of the most difficult aspects of presenting The ICBM Modernization Briefing because most new briefers have very limited knowledge about events that preceded current program activities. The handbook authors were assigned to XPQ before attending Air Command and Staff College, and they presented The ICBM Modernization Briefing several hundred times. The one area in which they never really felt totally comfortable was in answering audience questions during the post-briefing period. Questions which pertained to aspects of the current program were not a problem because they worked those programs every day. However, questions about the controversial political history of the Peacekeeper program or about arms control, for example, were difficult to answer because of the authors' limited backgrounds in these areas. Their backgrounds were similar to the backgrounds of current briefing officers who are typically on their third assignment after having served at an operational missile wing and then at a second assignment such as the 4315th Combat Crew Training Squadron, 3901st Strategic Missile Evaluation Squadron, 1st Strategic Aerospace Division Headquarters, or 15th Air Force Headquarters. Since the credibility of a briefer's presentation is tested during the question and answer period, a briefer needs to be as knowledgeable as possible to respond confidently and credibly. This is the basic reason why the authors prepared a handbook--to enhance a briefer's knowledge and, in turn, his effectiveness in articulating command requirements.

3. The ICBM Modernization Briefing is presented to virtually every civilian and military distinguished visitor to Headquarters SAC to advocate the need for continued ICBM modernization (see Atch 1). Therefore, XPQ presents the briefing to literally hundreds of influential people each year, including Senators and Representatives and their staff

members, senior representatives from the Office of the Secretary of Defense and the Office of the Secretary of the Air Force, members of the Joint Chiefs of Staff, and senior United States and foreign civilian and military leaders. Other visitors include distinguished civilians from across the United States, including mayors, businessmen, educators, and others who can be extremely influential at the grass roots level within their communities. This latter category of visitors also includes national and foreign media representatives who subsequently prepare articles on ICBM modernization for publication (6:42). A briefer's effectiveness in advocating program requirements can be influenced by the diverse backgrounds of these audiences. Many people have attitudes that have been affected by the controversy surrounding the search for a basing mode for the Peacekeeper missile. This controversy has existed since the requirement for Peacekeeper was first published by SAC in 1971 (15:58). Despite the support of the past four Presidential administrations and the past six Secretaries of Defense (8:103-104;17:--), the Peacekeeper program is still fighting an uphill battle to achieve a full 100 missile operational deployment capability (18:--). Fortunately, senior Air Force leaders continue to provide strong support for ICBM modernization. In fact, Air Force Chief of Staff, General Larry D. Welch, and General John T. Chain, Jr., CINCSAC, recently reconfirmed their commitment to completing full deployment of 100 Peacekeeper missiles and fielding the Small ICBM (3:99-101). The Air Force will continue to face tough audiences in the future, and a briefer must be prepared to respond to controversy whenever he presents the briefing. In discussing briefing the public, Air Force Secretary Edward C. Aldridge, Jr., recently stated, "We share a corporate responsibility to keep the American people informed about what we do and how we do it. . . unfortunately our efforts are often mediocre at best" (10:--). Although he was not specifically referring to advocacy for the ICBM modernization program, his comment is well taken. When briefing programs to the public, the Air Force usually only gets one opportunity with each audience, and it cannot be mediocre if it is to be effective. When an XPQ briefer presents The ICBM Modernization Briefing, he is the spokesman for the ICBM modernization program and personifies the Air Force. He must project an image of maturity, confidence, and credibility since the success of his advocacy and the reputation of the Air Force are on the line. The handbook is designed to help today's ICBM modernization advocate meet the challenge to respond effectively to the controversy inherent in presenting The ICBM Modernization Briefing to diverse audiences.

4. By developing a more complete understanding of all facets of the ICBM modernization program, a briefer can enhance his

own future leadership potential. Although this is a secondary objective, the handbook can help a briefer develop this knowledge. One of the foremost professional obligations of every officer in the Air Force is to improve his leadership skills to prepare for future supervisory or command opportunities. Although there are many aspects of leadership, Edgar F. Puryear, Jr., a noted expert on military leadership, stated, "professional knowledge is indispensable for success in military leadership" (1:x;2:xiii). In addition, during the 1987-1988 ACSC school year, two four-star Air Force generals and one three-star Army general stated that one of the most important aspects of effective leadership is job knowledge. Many XPQM briefers must rely upon more senior Air Force leaders to provide the details about how and why a program developed. However, as these younger officers progress towards other leadership opportunities, they will become the senior leaders, and they will have to answer the tough questions for their own subordinates. Although The ICBM Modernization Briefer's Handbook was not primarily developed to enhance a briefer's leadership potential, it helps develop that potential through increasing his job knowledge and understanding about the programs he advocates. Understanding and knowledge are the essence of maturity, confidence, and credibility, which are three traits required not only for briefing officers, but also for Air Force leaders.

5. The preceding paragraphs examined the author's rationale for the need for The ICBM Modernization Briefer's Handbook, and this paragraph will examine what is contained in the handbook and why the authors selected it for development. In general, the handbook contains information the authors believe will enhance a briefer's ability to effectively advocate ICBM modernization requirements. The authors intend for the handbook to be a first step in developing a well documented reference to help new briefers prepare to present The ICBM Modernization Briefing.

a. Chapter One provides an introduction to the reader. It examines the need for the handbook and introduces the contents of each subsequent chapter.

b. Chapter Two reviews the basic fundamental concepts of United States defense policy, nuclear deterrent strategy, and the contributions of the ICBM leg of the strategic nuclear Triad. This information is presented in the one-third of The ICBM Modernization Briefing that does not address specific Peacekeeper or Small ICBM program requirements. This front-end portion of the briefing is very important in framing the need for ICBM modernization for an audience. In the authors' opinion, clear, concise

articulation of these fundamentals is essential to successful advocacy. Furthermore, General Chain, in a recent article, stated, "SAC needs to return to the basics and try to explain what we are trying to do in the strategic nuclear world and why we are trying to do it" (5:64). Deterrent strategy has been effective for the past forty years, and it forms the basis for all subsequent modernization activities in support of achieving United States national objectives.

c. Chapter Three reviews the complex interweaving of doctrine and nuclear strategy between 1945 and the early 1970s and their impact on the early ICBM development program. Many influential senior American policymakers were schooled during this period, and they may continue to be influenced by attitudes developed early on about the need for ICBMs as part of the US force posture. In the authors' opinion, understanding these early influences can help a new ICBM modernization advocate appreciate the diverse attitudes of some members of his audiences.

d. Chapter Four reviews the impact of the arms control process imposed on ICBM modernization activity. Since this is one of the three basic pillars of the Scowcroft Commission recommendations (14:31) endorsed by President Reagan and Congress in 1983 (12:v), the authors felt this was one area in which briefer knowledge was especially limited. This chapter specifically reviews the Strategic Arms Limitations Talks (SALT) I and II, and the role of the Intermediate Range Nuclear (INF) agreement and the proposed Strategic Arms Reduction Talks (START).

e. Chapter Five reviews the early history of the Peacekeeper and Small ICBM programs between the period from the initial submission of a requirement for Peacekeeper in 1971 (15:58) until the conclusions of the Scowcroft Commission were adopted by the President and approved by Congress in 1983 (12:v). Special emphasis is placed on the recommendations of the Scowcroft Commission report since its fragile consensus essentially remains as the blueprint for the current ICBM modernization program (18:--). This chapter also examines prominent basing modes studied for the Peacekeeper missile.

f. Chapter Six reviews the most recent history of the Peacekeeper and Small ICBM programs. It begins with the 1985 Senate restriction on deploying Peacekeeper missiles in Minuteman silos and examines the resulting impact of this decision on continuation of the Peacekeeper program. Chapter Six subsequently examines and concludes with the 19 December 1986, two-part Presidential decision to enter full-scale engineering development for the Small ICBM and to enter research and development of a rail garrison basing mode for Peacekeeper (13:--).

g. The handbook will conclude with various appendices to provide additional detail and quick reference facts and figures.

6. In conclusion, The ICBM Modernization Briefer's Handbook is designed to enhance an ICBM modernization advocate's effectiveness in articulating program requirements. The authors of the handbook spent six cumulative years in XPQ, and they often felt as if they were the inheritors of a Sisyphean task. Sisyphus, in Greek mythology, was "a king of Corinth condemned forever to roll a stone up a hill in Hades only to have it roll down again when nearing the top" (3:386). Many capable advocates have preceded today's ICBM modernization briefers in the effort to push the Peacekeeper program to the brink of full operational capability, only to see it come crashing back down, shrouded in disbelief and uncertainty. Nevertheless, throughout the long and controversial history of the Peacekeeper, and more recently, the Small ICBM programs, the essential military requirement for these weapon systems has not changed. The challenge remains to be mature, confident, and most importantly, credible when presenting this requirement to an often skeptical American public. The authors of the handbook presented many briefings during their tenure in XPQ without the benefit of a handbook because until The ICBM Modernization Briefer's Handbook (Atch 2) was developed, there was no handbook. The authors know what kinds of information would have been helpful to develop better confidence, and in turn, be more effective. They have gleaned some of the pearls of wisdom from many source documents and have consolidated them to produce their handbook. The handbook takes a first step towards filling a gap in a briefer's knowledge created by the lack of a more structured training program. In the long run, this knowledge can make a briefer a better advocate, a better leader, and a better officer. The handbook is not an end in itself, but if it helps an ICBM modernization advocate to be better both professionally and personally, then it will have accomplished its objective. The handbook satisfies a valid need for the Strategic Air Command and for the United States Air Force.

2 Atch
1. XPQ Letter, 31 Dec 87
2. Handbook

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DEPARTMENT OF THE AIR FORCE
HEADQUARTERS STRATEGIC AIR COMMAND
OFFUTT AIR FORCE BASE NEBRASKA 68113-5001

31 DEC 1987

REPLY TO ATTN OF: XPQ

SUBJECT: Sponsorship of Research Project

ACSC/EDC

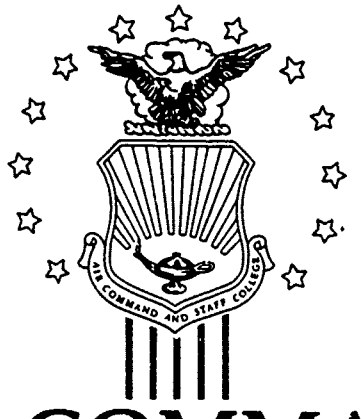
1. I enthusiastically support Majors Steve Garcia and Terry Kemp in their research project to develop The ICBM Modernization Briefer's Handbook. I am the HQ SAC Director of Intercontinental Ballistic Missile (ICBM) Requirements and this directorate is responsible for developing, coordinating, and articulating SAC requirements for modifications to deployed ICBM weapon systems as well as requirements for new ICBMs, specifically the Peacekeeper and the Small ICBM. These high-priority programs are briefed to virtually every distinguished visitor who visits SAC Headquarters. The handbook proposed by Majors Garcia and Kemp has the potential to enhance this directorate's ability to convincingly articulate command requirements. Additionally, such a handbook will be useful for new directorate briefers.

2. Majors Garcia and Kemp were two of the most effective briefers in this directorate. They have a keen appreciation of what makes briefers more effective, confident, and credible. During their tenure here, we discussed the usefulness of a handbook to capture the experience of past briefers and to assist new briefers in presenting the "ICBM Modernization Briefing," a centerpiece briefing for all distinguished visitors.

3. I would be pleased to sponsor Majors Garcia and Kemp, and appreciate their decision to assist this directorate. If you have any questions pertaining to my sponsorship, please contact me at AV 271-5801.

CHRISTOPHER I. BRANCH, COL, USAF
Director of ICBM Requirements
DCS/Plans

Peace . . . . is our Profession



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STUDENT REPORT

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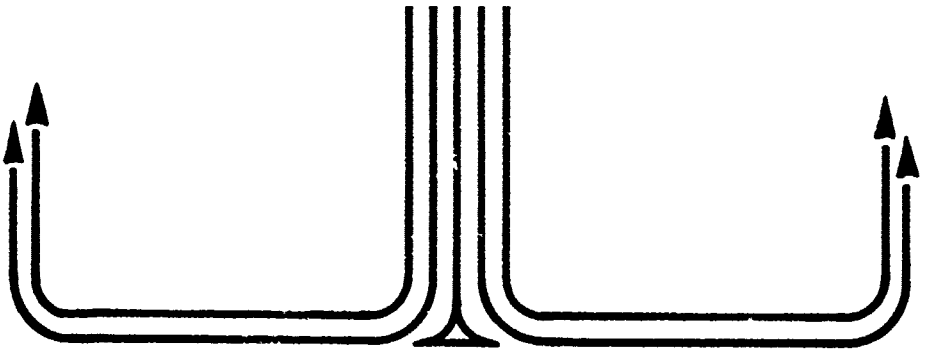
"insights into tomorrow"



PREFACE

Advocating the need for ICBM modernization is a difficult challenge. Despite the support of the last four Presidential administrations, the Peacekeeper program has still not achieved a full 100 missile operational capability (25:103-104). Although Peacekeeper deployment in Minuteman silos at Francis E. Warren AFB, Wyoming, is well underway for the first fifty missiles, the Air Force faces a continuing uphill battle to secure support for the second fifty missiles in a Rail Garrison basing mode and for the Small ICBM based in Hard Mobile Launchers. Obtaining continued support for these nationally significant programs will depend upon the effectiveness of the advocacy role conducted by Air Force officers who work the program. The challenge remains to be mature, confident, and most importantly, credible when presenting this requirement to an often skeptical American public.

The ICBM Modernization Briefer's Handbook is designed to enhance an ICBM modernization advocate's effectiveness in articulating program requirements. The authors of the handbook presented many briefings during their six cumulative years at Headquarters SAC without the benefit of a handbook, and they know what kinds of information would have been helpful to develop better confidence, and in turn, be more effective. The authors have gleaned some of the pearls of wisdom from many source documents and have consolidated them into this handbook. The handbook takes a first step towards filling a gap in a briefer's knowledge due to the lack of a structured training program. In the long run, this knowledge can make a briefer a better advocate, a better leader, and a better officer.

We wish to acknowledge the support and encouragement provided by Colonel Christopher J. Branch, the Director of ICBM Requirements; Lt Colonel Joseph E. Sutter, Chief of the Advanced Missile Development Division; and especially Captain Dennis E. Lyon, Chief of the Peacekeeper Maintenance Section.

ABOUT THE AUTHOR

Major Stephen R. Garcia is a missile staff officer who has served in both Minuteman Intercontinental Ballistic Missile (ICBM) operations and maintenance. His most recent assignment before attending Air Command and Staff College as a member of the Class of 1988 was as an Advanced ICBM Development Planner in the Directorate of ICBM Requirements (XPQ) at Headquarters Strategic Air Command (SAC), from 1984 through July 1987. During this three year tour of duty Major Garcia worked primarily in requirements development for the Peacekeeper weapon system, and for the last two years of his assignment was the Program Element Monitor for Peacekeeper. Major Garcia was also the primary briefer of The ICBM Modernization Briefing and presented several hundred briefings during his tenure. Major Garcia was instrumental in the initial development of the Rail Garrison basing mode for Peacekeeper. Before his assignment to Headquarters SAC, Major Garcia served for nine years at Francis E. Warren AFB, Wyoming, starting in maintenance and later transitioning into operations. He subsequently worked in the Plans Division and the Emergency War Orders Training Branch, completing his operations tour as the Chief of EWO Training for the 90th Strategic Missile Wing.

Major Terrill L. Kemp is a missile operations staff officer. His most recent assignment before attending Air Command and Staff College as a member of the Class of 1988 was as the Chief of the Peacekeeper Test Section in the Directorate of ICBM Requirements at Headquarters Strategic Air Command. During his three and one-half years in XPQ, Major Kemp worked exclusively on developing SAC requirements for the Peacekeeper weapon system. Major Kemp worked the early development of the Rail Garrison basing mode for Peacekeeper, and also presented The ICBM Modernization Briefing. Major Kemp was a Top Hand officer in the 1st Strategic Aerospace Division's Test and Evaluation Deputate, at Vandenberg AFB, California. Before his assignment at Vandenberg AFB, Major Kemp had a tour in missile operations in the 341st Strategic Missile Wing at Malmstrom AFB, Montana. Major Kemp was a Minuteman II crew member in the 10th Strategic Missile Squadron, an evaluator, and an Emergency War Orders training officer.

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Chapter One

INTRODUCTION

> Sisyphus: Greek Mythology. A king of Corinth condemned forever to roll a stone up a hill in Hades only to have it roll down again when nearing the top (13:386).

At first glance, the challenge to advocate the continuing need for ICBM modernization appears to be a Sisyphean task. Many capable advocates have preceded you in their effort to push the program to the brink of full operational capability, only to see it come crashing back down, shrouded in disbelief and uncertainty. Nevertheless, throughout the long and controversial history of the Peacekeeper, and more recently, the Small ICBM programs, the essential military requirement for these weapon systems has not changed. The challenge remains to be mature, confident, and most importantly, credible when presenting this requirement to an often skeptical American public.

The purpose of this handbook is to help you become a more effective advocate for the ICBM modernization program. The handbook will try to give you a better appreciation for some of the basic concepts that form the foundation for a credible and defensible position. It will not discuss the programmatic details of the Peacekeeper or Small ICBM programs because in the dynamic environment of ICBM modernization they are constantly changing. However, it will provide a brief glimpse at some of the earlier program developments which have shaped the current ICBM modernization environment, and which continue to influence the attitudes and opinions of key policy makers in the United States today. Furthermore, it will examine the continuing rationale for these programs.

We acknowledge that you are very capable of presenting The ICBM Modernization Briefing without the benefit of this handbook; obviously, the briefing has been presented very effectively for years without one. However, one of the areas that we usually felt uncomfortable with was the post-briefing question and answer period. In retrospect, it appeared that most of the tough questions dealt with areas of the briefing that we were most unfamiliar with, for example, the history

of first and second generation missile systems, arms control, previous basing modes, etc. We didn't have any background in those areas and didn't work with them in the day-to-day environment. So our approach with this handbook was to start at square one and build a product that combines some basic concepts such as US defense policy, deterrence, the diversity of the Triad, and the contribution of the ICBM, as well as some information about the historical development of an American ICBM capability. We felt that this background would serve you in good stead to build a basic framework of knowledge from which to prepare for the questions that you may inevitably be asked. We intend for this handbook to be a first step, and we hope you will build upon it to develop even greater effectiveness in your ICBM modernization advocacy mission.

Chapter Two

FUNDAMENTALS--DETERRENCE AND THE TRIAD

INTRODUCTION

When presenting The ICBM Modernization Briefing, it is important to properly frame the requirement for continued modernization. The purpose of this chapter is to provide you with a better appreciation for basic United States defense strategy and the concept of deterrence since these are fundamental concepts underlying the need for continued ICBM modernization. The chapter will subsequently review the necessity of maintaining a Triad of strategic nuclear offensive forces and will specifically address the contributions made to the Triad by the ICBM. As General John T. Chain, Jr., CINCSAC, recently stated, "SAC needs to return to the basics and try to explain what we are trying to do in the strategic nuclear world and why we are trying to do it" (17:64). This chapter examines "the why."

NATIONAL SECURITY AND DEFENSE STRATEGY

> For the past 39 years, the concept of deterrence has been the cornerstone of our nuclear policy, and, indeed, of our entire national security posture. . . deterrence is the most effective means of preserving the freedom and independence of the Western World in the nuclear age (25:99).

Deterrence of aggression is the principal objective of the US strategic doctrine of flexible response, "which has been US strategy since 1961" (34:26). Former Secretary of Defense Caspar Weinberger, in the Fiscal Year 1988 Annual Report to Congress, said:

> Deterrence works by persuading potential adversaries that by <u>their</u> perceptions, the probable costs of their aggression will exceed the probable gains. Thus, the US strategy to deter aggression does not just depend on our actual military capabilities. . . It also involves our <u>adversaries' perceptions</u> about those capabilities as well as the other elements of our strategy. . . the

> effectiveness of our deterrent will be determined in our opponents' minds, not in ours" (34:25).

The National Security Strategy Report, produced by the White House, specifically addresses deterrence in terms of the Soviet Union:

> Nuclear deterrence, like any form of deterrence, requires us to consider not what would deter us, but what would deter the Soviets, whose perceptions of the world and value system are substantially different from our own (33:--).

> The Soviet leadership must be convinced that an attack on the US or its allies would entail unacceptable retaliatory costs. . . We must be able to put at risk those types of Soviet targets--including hardened ones such as military command bunkers and facilities, missile silos, nuclear weapons and other storage, and the rest--which the Soviet leaders have given every indication by their actions they value most, and which constitute their tools of control and power (3:161).

Effective deterrence, then, relies upon making clear to an adversary that the US "will respond powerfully to aggression" (34:25), but this also requires the US to maintain credible forces to implement this response. Former Secretary Weinberger further stated, "our purpose is to prepare for war so well that we successfully deter aggression. . . But should deterrence fail, our strategy is to secure all US and allied interests, and deny the aggressor any of his war aims" (34:27).

> The core of our military strategy . . . is deterrence. Deterring strategic nuclear conflict with credible retaliatory nuclear forces has been the cornerstone of US national security posture for over 40 years, and there is no credible alternative strategy available today (32:--).

DIVERSITY OF STRATEGIC FORCES

The US maintains a Triad of strategic nuclear offensive forces comprised of ICBMs, manned bombers, and submarine launched ballistic missiles to complement the US strategy of flexible response to deter aggression. The unique contributions of each of these components combine to achieve a full spectrum of deterrence by introducing complexity into the Soviet planning process. The diversity of the US Triad

"enhances the survivability of US strategic forces" (3:8) to deter nuclear attack, and "reduces Soviet chances of success and increases the margin of safety and stability in a crisis" (50:4).

> The strategic Triad is designed to support our deterrent policy by providing a force posture that both minimizes Soviet incentives to initiate a nuclear attack on us or our allies, and ensures that our forces are capable, under all conditions of war initiation, of surviving a Soviet first strike and retaliating effectively (25:99).

There are four basic strengths of the Triad which contribute to its effectiveness in enhancing the US defense strategy of deterring war.

> First, it makes the enemy's targeting task very difficult and complex. Second, it requires that any attack be timed to strike all three components, in all locations, at one time. Third, the enemy has to split his defenses to protect against three different types of attack. And fourth, it is a hedge against a sudden advance in the technology of a defense against one of the three types of Triad weapon systems (1:13).

The first three strengths of the Triad reflect the enhanced survivability provided by the diversity of forces. This diversity makes the targeting and timing problems for the Soviet attack planner so complex that he cannot be sure a Soviet first strike against the US would destroy all three elements of the Triad and thus prevent a second strike by US forces that would inflict unacceptable damage on the Soviet homeland. This is the essence of deterrence. Although the following excerpt from Missiles In The Nineties is lengthy, it best captures the complexities a Soviet planner must consider when planning an attack against the US:

> If the Soviet Union wishes to launch a coordinated, effective ballistic missile attack on US bombers, ICBMs, SLBMs in port, and US strategic command and control, it must either launch its ICBMs and SLBMs simultaneously or stagger their launches so that the SLBM and ICBM weapons arrive at the same time. As a result, the Soviet attack planner faces an attack timing problem because if the planner elects to launch SLBMs and ICBMs simultaneously, the SLBMs will impact first, but they will not have sufficient accuracy to destroy US ICBMs in their silos. The US ICBM force would have time to react

> before the Soviet ICBMs arrived perhaps 10-15 minutes later. However, if the Soviet planner wants to have his SLBM and ICBM weapons detonate on US targets at the same time, he must launch his ICBMs first, which will give the bombers and SLBMs an opportunity to survive. The ICBM leg might be susceptible to destruction by the arriving Soviet ICBMs, but the other two legs of the Triad would survive. As a result of this attack timing dilemma, the Soviet attack planner can never be confident that he will be able to confidently neutralize all legs of the US strategic nuclear Triad before some elements could escape and inflict unacceptable damage on his homeland. Therefore, the US defense strategy of deterrence is served because it prohibits a confident, high probability attack by the Soviets against the continental US (3:9-10).

Diversity further enhances the survivability of US strategic forces by denying the Soviets the opportunity to concentrate their research and development efforts on countering a single component of the Triad. "Thus, the existence of several components of our strategic forces permits each to function as a hedge against possible Soviet successes in endangering any of the others" (37:7). "For example, if the United States chose to deploy only missile-carrying submarines, it would run the risk of the Soviet Union being able to concentrate its resources on antisubmarine warfare without having to conduct research and development activities for the other legs of the Triad" (3:11).

"Hence for the predictable future, the Triad concept increases the probability that a significant portion of US strategic forces will survive a Soviet attack" (3:12). Survivable, effective US military forces, combined with the will to respond to Soviet aggression, achieves the US objective of deterrence.

THE ICBM CONTRIBUTION

ICBMs make a significant contribution to achieving deterrence in two ways. First, since effective deterrence is a function of Soviet perceptions, US ICBMs provide a capability that the Soviets respect.

> Soviet military writings and Soviet investments in ICBMs strongly indicate the Soviets regard ICBMs as the dominant strategic system. The Strategic

> Rocket Forces are the elite military service in the Soviet armed forces. Accordingly, the Soviet Union perceives an ICBM-armed US as a more powerful adversary which possesses a significant number of the very weapons they themselves would rely on most heavily in the event of a war (3:13-14).

Second, US ICBMs have unique operational capabilities that contribute to the US strategic doctrine of flexible response to deter aggression.

> Land-based ICBMs comprise an essential element of the strategic Triad and comprise about half of the nation's day-to-day alert weapons. Their high reliability, high alert rate, planning flexibility, and quick response distinguish them among strategic forces (43:2-3).

One of the foremost qualities of the ICBM is its ability to accurately put a weapon on a target within approximately thirty minutes. This is what is meant by the term prompt. The bomber force would require hours to arrive over target, and the SLBM requires time to receive and respond to appropriate execution directives. Therefore, only the ICBM can provide a true prompt response, if required.

> For the predictable future, ICBMs will possess the best prompt countermilitary capability of all US strategic forces: their combination of weapon yield, accuracy, quick reaction time, and short flight time gives the United States the ability to place at risk most of the assets which are important to the conduct of Soviet war operations--including ICBMs which the Soviets will have withheld from an initial attack. The ICBMs ability to attack promptly and destroy key elements of Soviet offensive forces also provides the greatest measure of damage limiting counterforce capability to the United States, and the greatest prospects for early war termination (3:14).

In addition to its prompt, countermilitary delivery capability, all US ICBMs are based in the continental US. Not only does this provide an increased measure of security, but a nuclear attack against these forces would constitute an unambiguous attack against the continental US (3:13). In case this appears to be too obvious, consider the example of a nuclear submarine in international waters. If an attack occurred against an American submarine, there might not be clear indications that an attack against the US is underway. An attack against US ICBM forces would provide a clear signal

to the National Command Authorities (NCA) to take appropriate action.

Continental basing also provides the ICBM component of the Triad with the capability to maintain robust and redundant, positive command and control. It is this robust command and control that permits such quick reaction time and a rapid retargeting capability to provide the NCA with increased flexibility throughout the spectrum of conflict (3:14).

ICBMs have traditionally maintained a near 100 percent alert rate for only approximately 12 percent of the Triad operating and support costs (3:14,15;30:68).

> The high alert rate and quick responsiveness of US ICBMs combine to further discourage a surprise first strike on the United States by forcing the Soviet Union to worry about vulnerability of their own strategic forces--a good portion of which are not on day-to-day alert--to prompt US retaliation (3:14).

The high alert rate of US ICBMs significantly contributes to deterrence of nuclear war because of the fact that the Soviets do not maintain many of their forces on day-to-day alert.

> To illustrate, if the Soviets decided to attack the United States, they would want to have available to them as much of their strategic force as possible to insure a high confidence, high success attack. But if they generate their forces, the Soviets may alert the United States, sacrifice the element of surprise and diminish the effectiveness of a surprise attack. Thus, contrary to a widely held belief, highly responsive US ICBMs inhibit rather than encourage Soviet first strike planning (3:14-15).

In summary, the unique contributions of the US ICBM provide considerable operational capability to enhance the US defense strategy to deter nuclear war.

> The distinctive qualities of the ICBM, as contrasted with other classes of strategic weapons, are the qualities most appropriate to hold at very plausible risk the highest value assets of the Soviet state. Put in cross-cultural terms, the US protects its highest value (people) by holding at risk the highest values of the Soviet Union (the

political control structure and major elements of its most potent military capability). Cruise missiles, penetrating bombers, and SLBMs all have valuable synergistic roles to play for deterrence, but they cannot today, or prospectively tomorrow, provide a level of dissuasion capable of substituting for the ICBM (3:17).

CONCLUSION

This chapter reviewed the basic fundamentals underlying the need for continued ICBM modernization, essentially "the why we are doing it" aspect referred to by General Chain (17:64). The bottom line is that the ICBM modernization program is being conducted to directly enhance the capability of US forces to support the US doctrine of flexible response and the strategy to deter nuclear war.

Chapter Three

THE HISTORICAL EVOLUTION OF NUCLEAR STRATEGY AND ICBM DEVELOPMENT

INTRODUCTION

The American approach to developing nuclear forces has been significantly influenced by the evolution of post-World War II doctrine and strategy. As Chapter Two pointed out, the US has maintained a doctrine of flexible response since 1961. However, this doctrine has embraced many different policies and strategies over the years that have shaped the American approach to developing strategic nuclear and conventional forces to support the objective of deterring aggression. The purpose of this chapter is to briefly examine the early evolution of strategy from 1945 through the early 1970s to see how it impacted the early ICBM development program. The chapter is organized chronologically by Presidential administrations to accomplish this purpose. Within each of these major headings, doctrine and strategy are reviewed, then there is a section on ICBM development activity in that administration.

THE IMPACT OF WORLD WAR II

The immediate postwar international and domestic environment significantly influenced the development of American doctrine and strategy to secure the nation's defense. With the postwar occupation of Eastern Europe by the Soviets, the United States faced a serious dilemma: how to contain the Soviets while at the same time complying with the domestic American desire to demobilize after the war and return to normalcy. The answer to the dilemma seemed to be in the United States' virtual monopoly of nuclear weapons.

THE TRUMAN ADMINISTRATION: 1945-1953

Nuclear Superiority

The Truman administration can probably be best characterized as responding to the dilemma by relying on the

US superiority in atomic weapons and a strategic bomber delivery capability to contain the Soviets (2:4). This solution could comply with domestic pressure for a rapid demobilization of American conventional forces, which occurred between 1945 and 1950, and was believed to provide sufficient deterrence to Soviet aggression (6:6). Since the American people were reluctant to support continued high defense budgets to sustain both conventional and nuclear forces, the emphasis during this administration clearly favored development of nuclear technology (9:105-108). Initially, the constrained defense research and development budget forced the Air Force to concentrate on improving its bomber capability, and ICBM research remained under-funded and constrained by technological problems associated with the heavy atomic weapons of the period (40:9-10). Nevertheless, the early ICBM research conducted during the Truman administration paved the way for subsequent development of a true ICBM capability during the subsequent Eisenhower administration.

> The Truman Administration, having proclaimed the policy of containment in 1947, found in the nuclear deterrent strength of the Strategic Air Command a force that promised to keep the Soviets in line at a very economical cost in defense dollars. . . The public was very receptive to the concept of nuclear deterrence, and the Government saw it as an intelligent alternative to attempting to match the Soviet's large field force in conventional strength. By 1948, with long-range B-36s coming into the inventory, the Air Force sincerely believed that SAC and the A-Bomb would either prevent communist aggression or win any new war that might erupt (2:4).

Although the Truman administration continued its policy of nuclear superiority through the end of its term, several events occurred between 1949 and 1950 that caused the administration to reexamine defense strategy and force structure, and the subsequent actions taken in response to these events would have an indirect impact on the development of an American ICBM capability. First, in August 1949, the Soviets tested their own atomic bomb several years sooner than the US intelligence community had expected (9:107). Second, "the Communist Chinese defeated the Nationalist forces of the Republic of China on the mainland and took possession of the whole of China, except the island of Taiwan" (9:107). The Truman administration regarded these events as an increased threat to the West, and President Truman made two important decisions to address this new situation. First, to insure the US would maintain

superiority in nuclear technology, he authorized research and development of an American hydrogen bomb, called "the Super" (9:107). This decision would prove to be significant for subsequent development of an American ICBM capability because the hydrogen bomb would reduce the weight of a nuclear warhead from several tons to hundreds of pounds, which was the single-most technological obstacle to overcoming propulsion, guidance, and reentry problems (40:10-11). President Truman's second decision in 1949 created "an interdepartmental task force to undertake a general review of US national security and make recommendations for new policies" (9:107). This resulted in a National Security Council document, NSC-68, which "was the first comprehensive analysis and synthesis of a national strategy for the US in the postwar world" (9:107).

> NSC-68 concluded that the US needed much stronger nuclear and conventional forces than presently existed. . . and warned that within four years the Soviets would have ample atomic bombs and a suitable delivery system to enable them to offset the existing US nuclear deterrent capability (2:5).

The significance of NSC-68 was that it recognized that nuclear superiority alone could not completely address US defense needs to be able to respond to Soviet or Chinese aggression (6:38).

As the Truman administration began to seriously consider the implications of NSC-68, another event occurred that would impact the development of strategy--the North Korean invasion of the Republic of Korea in June 1950 (2:6). The Korean War emphasized a weakness in the doctrine of nuclear superiority. American nuclear superiority had not only failed to prevent outbreak of this limited war, but the resulting conventional and strategic forces buildup failed to bring the war to a "quick, decisive victory" (2:5). American frustration with the this new type of "limited" war ushered in the Eisenhower administration with a mandate to insure the US never became embroiled in a limited war again (9:97).

Early Missile Research And Development: 1945-1953

The first serious study of an American ICBM capability began during the Truman administration, but for the most part, it was a budget and technology constrained effort (2:2,78;40:10). By the end of World War II and as a result of witnessing the limited successes of the German V-1 and V-2 programs and the destructive capability of the atomic bomb, the Army Air Forces recognized the potential of a long-range

ballistic missile. However, the first constraint to developing an ICBM capability was technology. "The technology did not exist to make a rocket fly the nominal intercontinental range of 5,500 nautical miles while carrying a multi-ton thermonuclear warhead" (5:58). This constraint would not be overcome until the US developed the hydrogen bomb in 1953 (40:10). The second constraint was funding. Faced with limited funds to support both research and development of aeronautical and ballistic missile systems, the Air Force guided missile program was cut from $29 million to $13 million (49:9), and eleven of twenty-eight active missile projects were cancelled, including the forerunner to development of the Atlas ICBM (41:5). The remaining projects focused on developing air-breathing guided missiles, which more closely paralleled research in aircraft development technology but would also be useful until technological constraints could be overcome to develop an ICBM capability (2:78-80). Although the resulting Snark, Navajo, and Rascal guided missile systems were inherently inaccurate, unreliable, and vulnerable (40:3-4), they provided significant developments in propulsion, guidance, and program management for subsequent development of a true ICBM (4:107).

In 1951, the Air Force initiated "Project Atlas," which would eventually result in the first American ICBM on alert in October 1959 (40:9;41:24). However, the outbreak of the Korean War constrained funds even more as the US rapidly built up its conventional forces to meet the new threat, and Project Atlas remained under-funded until accelerated by President Eisenhower in 1955 (40:9;41:10). This limited funding prevented any significant research breakthroughs in technological problems associated with propulsion, guidance, and nose cone reentry until they could be overcome by the weight reduction provided by the hydrogen bomb (40:10).

The Truman administration took the first significant steps towards developing an American ICBM capability. Although the bulk of development would occur under President Eisenhower, these first steps established a solid foundation.

THE EISENHOWER ADMINISTRATION

The "New Look"

The Eisenhower administration entered the White House in January 1953 with a clear mandate to prevent American involvement in future limited wars and a self-imposed obligation to balance the federal budget (9:109). As a result, the administration undertook a revision of defense strategy known as the "New Look" to accomplish these two objectives (2:6). The two pillars of the Eisenhower administration's defense policy were "the creation of a large

network of military alliances between the US and over fifty other nations around the globe;" and improving US strategic nuclear technology to preserve superiority (9:109-110). Pursuing this second pillar resulted in acceleration of ICBM development activity in response to Soviet technological achievements in ICBM capability, and by the end of the administration's term, the US had its first operational ICBM, the Atlas, on alert (41:24). The ICBM developments made between 1953 and 1960 formed the basic foundation for the ICBM capability existent today.

The nuclear superiority doctrine of the Truman administration changed names to become "massive retaliation" during the Eisenhower administration, but for all practical purposes it espoused the same message. "President Eisenhower believed the Soviets could defeat the US in either of two ways: by a strong nuclear attack on the American homeland, or by forcing the US to spend itself into bankruptcy through a series of limited wars around the world" (2:6). He did not agree with the recommendations of NSC-68 which called for the US to maintain conventional and nuclear symmetry with the Soviet Union (6:55).

> According to the Eisenhower administration, nuclear weapons of all descriptions and a strong strategic air force seemed to offer the best defense buy, for they could both deter Soviet aggression and quickly win any war that might erupt. Consequently, a primary element of the New Look was a reallocation of existing military resources away from conventional ground forces and toward buttressing air power and nuclear capabilities (2:6).

Therefore, just as President Truman had done before, US strategy would continue to rely upon strategic nuclear superiority as the primary means of deterring Soviet aggression.

Massive Retaliation

The Eisenhower administration formulated the doctrine of "massive retaliation" to capitalize on US nuclear superiority "by threatening to respond to [Soviet] conventional attacks against the free world with strategic warfare" (9:110). By 1953, President Eisenhower had made the decision "that all future wars on the scale of Korea and above would be considered nuclear for planning purposes" (2:6).

> The administration did not believe that any such thing would ever actually happen or be necessary. Massive retaliation was intended as a doctrine and

> policy of deterrence. It was an attempt to keep the defense budget relatively low and prevent new wars like Korea, while protecting the security of the West by extracting the greatest possible deterrent out of US military power (9:110).

Two emerging criticisms of massive retaliation would have an important impact on the subsequent evolution of US doctrine, strategy, and employment of forces. The first criticism centered on the emerging vulnerability of US strategic forces to a Soviet nuclear first strike, and critics believed massive retaliation was an even more dangerous invitation to resort to nuclear weapons on both sides (9:110-111). One of the primary points of emphasis was that deterrence required survivable, second strike US forces to respond to a potential Soviet first strike (9:111). As a result, the administration began placing strategic bombers on 24-hour alert, and subsequent ICBM development would emphasize "deployment in hard, underground silos, relatively invulnerable to anything short of a direct hit by an atomic warhead" (9:111).

The second criticism, which had an equally significant impact on the development of doctrine and strategy, centered on the lack of credibility of employing US nuclear capability for a Soviet or Chinese invasion of a third world ally (9:111-112). Many US allies did not believe that the US would actually launch a nuclear strike, and thereby invite Soviet retaliation, over an invasion of a third world ally. This might have been possible in the early 1950s when the Soviets had a small nuclear capability with limited ability to employ it against the US, but that time had passed by 1956. More importantly, critics claimed the Soviets and Chinese did not believe it either. Since deterrence is a function of an adversaries' perceptions (34:25), the lack of credibility would not deter further Soviet or Chinese aggression (9:110-112).

The Eisenhower administration essentially conceded the credibility argument and implemented a policy of "Graduated Deterrence" in 1957.

> The theory of Graduated Deterrence . . . represented an attempt to meet partway the credibility argument against Massive Retaliation, as well as to provide an alternative to maintaining large standing conventional forces. Implicitly conceding that it was hardly credible to threaten strategic war as a response to most limited attacks, the administration intended thereby to raise significantly the threshold at which a

> massive retaliation would be considered, filling the gap with the threat of tactical nuclear war (9:112).

Thus, the Eisenhower administration began to introduce some flexibility into its strategy, but it would not authorize increased defense expenditures to develop a force structure to truly implement a fully flexible response capability on the same order of magnitude as the Kennedy administration.

Although development of an American ICBM capability was well underway by 1957, two Soviet events contributed to an acceleration of US ICBM development activity. In mid-1957, the Soviets announced that they had tested a prototype ICBM, and "On 4 October 1957, the Soviets launched Sputnik I, the first artificial satellite" (9:114). These events, followed by two more Sputnik launches within several weeks of Sputnik I, awakened fears in the American public that the US was falling behind the Soviets in space and missile technology, and the seeds of a perceived "missile gap" were sewn (2:95). Although administration officials were pretty certain that this gap was not real, owing to secret U-2 reconnaissance missions over the Soviet Union, they became concerned about the vulnerability of US forces to a Soviet ICBM attack (9:114). The Soviets had tested a prototype ICBM several months before the Sputnik I launch, and soon afterwards Soviet Premier Nikita Khrushchev "began publicly boasting that strategic superiority had passed to the Soviet Union" (9:114). This eventually proved to be just rhetoric, but the Eisenhower administration was powerless to refute these claims. This forced the administration into an acceleration of the US ICBM development program to appease public concerns (9:114).

Developing An American ICBM Capability

The Eisenhower administration actively pursued developing US strategic nuclear capability to preserve superiority. Although research and development activity included bombers, submarine launched ballistic missiles (Polaris), intermediate range ballistic missiles (IRBMs--Thor and Jupiter) and ICBMs, the concern about a Soviet first strike capability being able to destroy the bombers on the ground resulted in acceleration of the IRBM and ICBM development programs. The Eisenhower administration started the golden years for the ICBM program. Between 1953 and 1960, the administration fielded Atlas, Titan I, and began research and development on second-generation Minuteman and Titan II ICBM weapon systems.

Atlas and Titan I. The Atlas and Titan programs were the first American efforts to develop an ICBM capability. Project Atlas had begun under the Truman administration, but it had remained constrained by budget and technological considerations until 1954 (40:10). The first breakthrough occurred in late-1953 when the Atomic Energy Commission succeeded in developing a hydrogen bomb (40:10). Another impetus for the fledgling ICBM development effort resulted from a Soviet announcement in August 1953 that they had successfully tested their own version of a hydrogen bomb (2:80). US intelligence experts had predicted this latter event would not occur for at least another decade, and it emphasized to President Eisenhower's stientific and technical advisors the need for a US ICBM capable of delivering nuclear warheads to counter the growing Soviet threat (2:80). These events resulted in reexamination of development of the US ICBM program (40:10).

As a result, in October 1953, the Air Force empaneled eleven nationally prominent scientists to review and evaluate Air Force missile programs (40:10). The two committee recommendations to President Eisenhower were acceleration of the Atlas program and development of a backup missile, Titan I, in case the site where the Atlas was being developed was attacked or in case of an explosion of a developmental Atlas missile (2:82;5:--). The Air Force Research and Development Command subsequently formed the Western Development Division, commanded by Major General Bernard A. Schriever, to implement the recommendations, and in January 1955, the Air Force and the Convair Division of General-Dynamics signed a production contract for the Atlas "D," the first operational version of the Atlas ICBM (41:9). There were three versions of the Atlas.

> The first operational version of the Atlas, the Series D Model, was a one and one-half stage, liquid fuel ICBM equipped with a radio-inertial guidance system and a nuclear warhead. It was stored in a horizontal position on a soft above-ground launcher (unprotected from the effects of nuclear blasts) and had an effective range, like all Atlas models, of approximately 6,500 nautical miles. The second Atlas ICBM configuration, the Series E model, possessed all-inertial guidance, improved engines, a larger warhead, and was stored in a horizontal position in a "semi-hard" coffin-type launcher. The final model of the Atlas, the Series F model, was superior to its predecessors in several ways. Like the Series E model the Series F Atlas was equipped with all-inertial guidance, but possessed improved engines, a quicker reaction

time due to its storable liquid fuel, and was deployed in a "hard" silo-lift launcher (40:7).

There were many technical obstacles to overcome in the development of the Atlas program, primarily in the areas of guidance and control systems, propellants, and reentry technology (2:83). Nevertheless, due largely to the efforts of General Schriever, the first successful Atlas launch occurred in November 1958 (2:83). On 31 October 1959, the 576th Strategic Missile Squadron (SMS), at Cooke AFB, California (now Vandenberg AFB), became the first SAC strategic missile squadron to place an American ICBM, a Series "D" Atlas equipped with a nuclear warhead, on strategic alert (40:18;41:24).

The Air Force approved Titan I development in April 1955 (2:82). The Titan I improved upon the Atlas design in two ways. First, it was the first "true" two-stage ICBM. This was considered an improvement because the second stage could be ignited "in near-vacuum" at altitude and provide better thrust capability (5:--). Second, Titan I was designed to be deployed in hardened silos (49:--). This second characteristic was designed to address the emerging vulnerability of US strategic weapon systems. On 8 September 1955, President Eisenhower assigned highest national priority to the Air Force's Atlas and Titan ICBMs, and on 27 October 1955 "[Headquarters Air Force] awarded a research and development contract to Glenn L. Martin Aircraft Company for development of the Titan weapon system" (41:10). "On 17 June 1958, the Air Force accepted delivery of the first Titan I ICBM from the Martin Company, formerly the Glenn L. Martin Aircraft Company" (41:18), and the first successful flight test occurred in February 1959 (2:82). Although the first Titan I wing was activated at Lowry AFB, Colorado, on 25 September 1958, funding constraints delayed delivery of the first operational missile until May 1961 (41:19,30). "Eventually between the period 1 April 1958 and 1 October 1961, SAC activated 13 Atlas and 6 Titan I ICBM squadrons" (40:13)

Minuteman I. Minuteman was the first second-generation ICBM, and research and development began before the first Atlas ICBM was placed on alert. The accelerated research and development activity authorized by the Eisenhower administration was resulting in tremendous breakthroughs in technology. One of the foremost advantages of the Minuteman weapon system was its use of solid-propellant instead of liquid propellants used by Atlas, Titan I, and subsequently, Titan II. General Schriever considered the development of solid-fuels "the most important breakthrough since World War II" (2:96). Solid-fuel technology would make it possible to

mass produce ICBMs and significantly reduce their reaction time if required to be launched (2:96). Headquarters USAF obtained Department of Defense approval to develop Minuteman I on 27 February 1958 (41:16). "From its very inception, the Minuteman program was oriented towards the mass production of a simple, efficient, and highly survivable ICBM weapon system capable of destroying all types of enemy targets with consistent reliability" (40:17). The Air Force also wanted a system that was inexpensive to operate and maintain (40:37).

In 1957, the vulnerability of US strategic forces became an issue as the Soviets began testing and deploying their own nuclear forces. This resulted in American emphasis on developing a survivable, second-strike capability. One concept that would come back around almost thirty years later for Peacekeeper basing involved placing a portion of the programmed Minuteman force (from 50 to 150 missiles) on mobile railroad cars (40:38). "On February 1959, Headquarters SAC submitted a requirement to the Air Staff calling for the first mobile Minuteman to be operational no later than January 1963" (40:39,40).

> In order to determine the feasibility of deploying Minuteman ICBMs on mobile railroad car launchers, Headquarters SAC ordered a series of tests to be conducted, nicknamed Operation Big Star. Beginning on 20 June 1960, a modified test train, operating out of Hill AFB, Utah, traveled across various railroad routes in the western and central sections of the United States in order to study such factors as (1) the ability of the nation's railroads to support mobile missile trains; (2) problems associated with command, control, and communication; (3) the effect of vibration on sensitive missiles and launch equipment; and finally (4) human factors involved in the operation of a mobile missile system. On 27 August 1960 . . . Headquarters USAF announced that the test of the Minuteman mobility concept had been satisfactorily completed (40:39-40).

Although the rail mobility tests demonstrated the capability to make Minuteman survive, "Headquarters USAF continued to assign top priority to the fixed silo-based Minuteman concept over the mobile one" (40:40). In December 1961, the Kennedy administration cancelled this basing mode in favor of deploying Minuteman in hardened, underground silos (40:40).

On 1 December 1961, SAC activated the first Minuteman squadron (Minuteman I-- Model A), the 10th SMS at Malmstrom AFB, Montana, but the first operational Minuteman I in the

10th SMS did not go on alert until 27 October 1962 (41:33,37). These first missiles in the 10th SMS served as President Kennedy's "Ace-in-the-Hole" during the Cuban Missile Crisis in October 1962. On 11 December 1962, "Headquarters SAC declared the first two flights of model "A" Minuteman I ICBMs at Malmstrom AFB to be operational, and this began continuous alert for Minuteman" (41:37).

Titan II. Headquarters USAF approved the development of the Titan II ICBM in October 1959, and in May 1960, awarded the Martin Company a research and development contract (41:23,26). The Titan II was designed to correct many of the problems experienced with Titan 1 and be able to carry larger payloads over a greater range (49:--). Titan II incorporated three significant improvements over Titan I. It used storable, hypergolic liquid propellants and could be launched from inside its silo without having to be lifted to the surface first, as was the case for Titan I. These two improvements significantly improved reaction time if the missile was required to launch. Titan II also employed an inertial guidance system, which had been programmed for the Titan I but transferred to Atlas (5:--). This considerably improved the guidance accuracy of Titan II over Titan I.

The first Titan II wing, the 390th SMW, and the first squadron, the 570th SMS, were activated at Davis-Monthan AFB, Arizona, on 1 January 1962, and the first Titan II ICBM went on alert in April 1963 (41:39). The US eventually deployed 54 Titan II missiles. The Titan II was a very capable member of the US ICBM team for approximately twenty-four years. On 2 October 1981, "Deputy Secretary of Defense Frank C. Carlucci ordered the deactivation of the Titan II ICBM weapon system as soon as possible" (41:70), and on 5 May 1987, the last Titan II ICBM "[came off strategic alert at Little Rock AFB, Arkansas, thus ending an era]" (27:35).

THE KENNEDY/JOHNSON ADMINISTRATIONS

Flexible Response

During the Eisenhower administration, Senator John F. Kennedy had been one of the harshest critics about the credibility of the massive retaliation doctrine, and upon his entry to the White House in January 1961, he resolved to do something about it. His administration's approach to defense became known as the "doctrine of multiple options," (2:102) or flexible response, and it remains as US doctrine today (34:26). Flexible response was essentially an extension rather than a complete revision of massive retaliation since the US would still rely upon maintaining superiority of its

nuclear forces. Under President Kennedy the ICBM program would improve significantly, but the administration also undertook to increase nonnuclear forces as well to provide a limited, flexible response across the entire spectrum of conflict. Actually, President Eisenhower had favored a flexible response doctrine, but he had been reluctant to spend the funds needed to build up all levels of US military capability. President Kennedy reversed this approach to defense spending by asking Secretary of Defense Robert S. McNamara to determine what forces were needed and to budget accordingly (2:94).

President Kennedy had expected to enter office confronted with Soviet superiority in strategic weapons, but the facts indicated the opposite (2:8).

> Although the Soviets continued to surpass the US in raw numbers of ICBMs even as late as 1962, no missile gap existed in the sense of an actual strategic imbalance. What the US lacked in numbers of ICBMs was more than made up by the quality of its ICBMs, by the missiles carried by Polaris submarines, and by the nuclear weapons in its manned bombers (2:96).

President Kennedy felt it was important that an imbalance not be created, and he directed continued build up of qualitatively superior US ICBMs.

> The Kennedy and Johnson administrations essentially doubled the number of ICBMs and SLBMs planned by the Eisenhower administration (1953-1961) and caused them to be built and put in place within five years, by 1966 (6:9).

Secretary of Defense McNamara, who served both Presidents Kennedy and Johnson, provided a tremendous influence on doctrine and strategy development during these two administrations. The policy of Assured Destruction was his.

The Strategy of Assured Destruction

"Assured Destruction was the declaratory nuclear strategy of the US" (6:11) during the Kennedy-Johnson administrations. The concept of Assured Destruction called for sufficient nuclear weapons:

> To destroy the Soviet Union as a viable society, or, as it was termed, to inflict "unacceptable

> damage" on that country. It was assumed that the destruction of approximately one-third of the population and two-thirds of the industry of the Soviet Union would cause the collapse of the Soviet Union as a modern industrial country. McNamara and his advisors believed that this capacity, dubbed Assured Destruction, was sufficient to deter a direct Soviet attack against the US and its most important allies" (6:12).

Assured Destruction relied upon an effective US second-strike capability, which meant US nuclear forces were "expected to be able to ride out the first nuclear strike and survive to deliver "assured destruction" on the enemy during the second and succeeding strikes" (2:101). "Developing a second-strike capability meant protecting land-based missiles by hardening the sites and, if possible, deploying them underground" (2:101).

Another essential component of the Assured Destruction strategy called for a limited counterforce targeting strategy to retaliate against Soviet military targets. This meant the United States could hold a relatively small number of essential Soviet targets at risk with a relatively small number of nuclear weapons. American strategists liked this strategy for two reasons. First, since there were a limited number of Soviet military targets, the US nuclear force requirements could be kept relatively small, and in turn would keep defense expenditures down. Second, sufficient capability to hold Soviet targets at risk could permit the US to refrain from developing US nuclear capability as fast as technology would allow in hopes the Soviets would follow suit. Unfortunately the Soviets did not embrace an American version of Assured Destruction, and they proceeded to develop more and better strategic weapons (6:12).

The Johnson administration continued to endorse the policy of Assured Destruction for its entire term, and in modified form, Assured Destruction carried over into the Nixon administration. The impact of this policy was that an attitude of sufficiency began to shape the strategic nuclear weapons environment. If a sufficient number of nuclear weapons could reduce the Soviet Union as a viable society, as defined by Secretary McNamara, then the US would achieve a point of diminishing marginal utility by adding more ICBMs to its inventory. Therefore, the ICBM force structure stabilized at 1000 Minuteman and 54 Titan II missiles and remained in that strength until the Nixon administration began to review the requirement for a new, advanced ICBM to address a prompt, countermilitary capability shortfall presented by the massive Soviet buildup in nuclear

weapons. This ICBM would be called the Peacekeeper (3:159;6:9-18).

Modernizing The ICBM Leg Of The Triad: Minuteman II and III

Minuteman II. On 2 October 1963, Headquarters USAF published a requirement for the Minuteman II ICBM (41:41). "The Minuteman II was a more advanced missile than the Minuteman I and incorporated a new, larger second stage, improved guidance, a greater range and payload capacity, and an increased capability to survive the effects of nuclear blasts" (41:41). In view of the numerous advantages of the Minuteman II over either model of the Minuteman I, on 8 November 1963 Secretary of Defense McNamara approved the Minuteman Force modernization Program (41:42). This project entailed the eventual replacement of the entire force of deployed Minuteman I ICBMs with Minuteman IIs and Minuteman IIIs (41:62). To accommodate the Minuteman II, it was necessary to completely retrofit the original Minuteman I launch facilities, launch control facilities, and associated ground equipment. The Minuteman Force Modernization Program began at Whiteman AFB, Missouri, on 7 May 1966, and was completed on 26 January 1975 with the emplacement of the last Minuteman III missile at F.E. Warren AFB, Wyoming (41:62;40:43).

The second phase of the Force Modernization program, which ran concurrently with the first phase modification of Minuteman I silos, was the construction of new Minuteman II launch facilities. On 28 February 1964, "Headquarters Air Force issued a contract for the construction of the first new Minuteman II ICBM wing, the 321st SMW, at Grand Forks AFB, North Dakota" (41:43). On 1 February 1965, "Headquarters SAC activated the first Minuteman II squadron, the 447th SMS at Grand Forks AFB, North Dakota" (41:46). The first Minuteman II ICBMs went on alert in the 447th SMS in January 1966 (41:49). Fourteen months later on 1 April 1966, SAC activated the twentieth and last Minuteman squadron, the 564th SMS at Malmstrom AFB, Montana (41:50). Once the 564th SMS achieved operational status on 21 April 1967, the deployment of the programmed force of 1000 Minuteman ICBMs was completed (40:43;41:52). In November 1964, Secretary of Defense McNamara made the decision to reduce the total Minuteman deployment from 1200 to 1000 missiles primarily because the Soviet Union could not overcome technical difficulties to perfect their second-generation missiles (9:115-116;41:45).

Minuteman III. "By the time the last Minuteman IIs of the 564th SMS were placed on strategic alert in the spring of

1967, significant progress had been made on the development of an even more advanced model of the Minuteman, the Minuteman III" (40:44). Headquarters Air Force had issued the first Minuteman III research and development contract to the Boeing Aerospace Company on 15 July 1965 (41:48). "The Minuteman III ICBM possessed an improved third stage, employed more penetration aids to counter anti-ballistic missile defense systems, and was equipped with the Mark 12 Multiple Independently Targetable Reentry Vehicle (MIRV) capable of carrying up to three warheads" (41:48). On 17 April 1970, the first Minuteman III ICBM was emplaced in a silo in the 741st SMS at Minot AFB, North Dakota (41:55). Eight months later, on 29 December 1970, the 741st SMS became the first SAC Minuteman squadron equipped with Minuteman IIIs to achieve operational status (41:57). On 11 July 1975, the 550th Minuteman III ICBM became operational at Malmstrom AFB, Montana (41:62). On 22 February 1977, President Carter terminated production of Minuteman III missiles (41:64).

By 12 July 1975, the Minuteman ICBM force consisted of 450 Minuteman IIs and 550 Minuteman IIIs. In addition, a number of modification programs were being carried out, aimed at increasing both the survivability and flexibility of the SAC ICBM force. These included the Silo Upgrade program, which increased the hardness of Minuteman silos, and the Command Data Buffer program, which provided for the rapid, remote retargeting of Minuteman ICBMs (40:45).

THE NIXON ADMINISTRATION

The Nixon administration came to office in January 1969, and continued to embrace the policy of Assured Destruction (6:18). However, the concept of Assured Destruction had begun to come under critical scrutiny as a result of the massive Soviet buildup of larger and more accurate ICBM weapon systems, such as their SS-18 which is the world's largest ICBM (6:18).

> By the mid-1970s, the Soviets had surpassed the US in numbers of launchers and throw-weight and was challenging the US in numbers of megatonnage and accuracy. It thus became theoretically possible that by using the large numbers of extremely accurate land-based missiles against US nuclear weapons, Soviet leaders might prevent the US from exercising its Assured Destruction capability (6:18).

During the early 1970s, policy makers became concerned about nuclear stability. "Stability exists when there is no

incentive for one side to resort to a preemptive nuclear strike" (6:18).

> Proponents of stability favor inaccurate weapons because if either side has the ability to destroy the other's strategic forces, then it might conclude that there was an advantage to striking first. In conformance with the logic of stability, US policy makers consciously refrained from building and deploying the large numbers of extremely accurate missiles and warheads necessary to attack Soviet missile silos all through the 1970s, even though the [US] was capable of deploying such weapons well before the Soviets" (6:17).

The stability argument mitigated against an anti-ballistic missile agreement or civil defense because these implied survival against a first-strike, and hence might reduce the deterrent value of nuclear weapons. The ABM Treaty signed in 1972 essentially codified this understanding by limiting the number of ABM sites each side could deploy (6:16).

The Nixon administration felt obligated "to respond to the dramatic growth in Soviet capabilities [manifested by the Soviet decision to deploy over three hundred SS-18 ICBMs]" (6:18-19). However, in compliance with the stability position, instead of adopting a counterforce strategy and developing a counterforce capability, the US decided to adopt a retargeting strategy to permit limited nuclear options (6:19). To comply with this new targeting strategy, the US also undertook to develop a new ICBM--the "Missile-Experimental," or "MX".

CONCLUSION

Since the dawn of the nuclear age, the United States and the Soviet Union have engaged in a seemingly endless arms race to develop strategic offensive nuclear forces to keep each other deterred from initiating war. In the post-World War II period, the United States decided to rely almost exclusively on its collective security agreements and its monopoly of nuclear forces, limited though they were, to achieve its national security objectives. This encouraged development of an American ICBM capability. Since then, attitudes about the proper force structure and the strategy for employment of nuclear weapons have evolved from maintaining a US superiority in nuclear forces and delivery capabilities, to sufficiency, and now some would argue the US needs to develop a war-fighting, counterforce strategy. In any event, many American attitudes have been formed during

this tumultuous period of complex, changing doctrine and strategy. Appreciating how the US developed its ICBM forces in compliance with these strategies might help you to understand some of the reluctance to endorse continued ICBM modernization today.

Chapter Four

ARMS CONTROL

INTRODUCTION

The role of arms control and arms reduction are fundamental to the debate of ICBM modernization. As both the US and the Soviets added nuclear weapons to their arsenals, there was a growing world-wide concern that these weapons were in excess to the numbers needed for mutual defense. Concerns over the arms race and its effect on world stability led to the start of the arms control process.

The purpose of this chapter is to review how the arms control process has influenced ICBM modernization. One of the objectives of the ICBM modernization program that is stated in The ICBM Modernization Briefing is to support arms control. Therefore, a working knowledge of its history will help you better understand the process, and in turn, better respond to questions about its role.

SALT I

The first series of Strategic Arms Limitation Talks (SALT I) were conducted from November 1969 to May 1972. These negotiations, conducted in Helsinki and Vienna, produced the Anti-Ballistic Missile (ABM) Treaty and an agreement to consider other limitations on land and submarine based offensive nuclear weapons (45:132-133). The beginning of the SALT I negotiations capped the decade of the 1960's in which efforts to halt the growth of both offensive and defensive armaments had failed. In 1964, President Johnson tried to begin discussions of arms limitations with the Soviet Union. He was interested in freezing the current levels of strategic weapons and using on-site inspection for verification (10:380). At this time the US enjoyed a 4-1 advantage in strategic weapons and the Soviet leadership was not interested in putting themselves into a position of inferiority (45:xxxii). They also rejected the monitoring by on-site inspection and there were no commonly accepted means of verification.

The focus of early arms control efforts centered on anti-ballistic missile systems. Both President Johnson and Defense Secretary McNamara resisted deployment of an ABM system because they felt it fueled the arms race and was destabilizing (12:8). However, support for an ABM system was voiced by Congressional Republicans, the military, and some members of the scientific community. By 1966 the Soviet Union had begun to deploy the so called "Galosh" ABM system around Moscow. Additionally, the People's Republic of China successfully tested a nuclear missile. While in the United States, research and development were leading to US deployment of its own ABM system (45:132). According to Henry Kissinger, President Johnson in 1967 had suggested to Soviet Premier Kosygin (at the "Mini-summit" at Glassboro, New Jersey) that both sides renounce ABMs. However, Kosygin refused the proposal (11:34). With regard to the Chinese threat, on September 18, 1967, the United States announced it would begin deployment of a limited ABM system called Sentinel. This decision was announced in a speech McNamara delivered in San Francisco which also established the US position to not attempt an ABM system against Soviet offensive forces (12:120-121).

> The Administration emphasized that the deployment was intended to meet a possible limited Chinese ICBM threat, to underscore US security assurances to its allies by reinforcing the US deterrent, and to add protection against "the improbable but possible accidental launch of an intercontinental missile by one of the nuclear powers" (45:132).

The US continued to press the Soviets to discuss strategic arms limitation. On July 1, 1968, President Johnson announced that agreement had been reached with the Soviet Union to begin discussions on limiting and reducing both strategic nuclear weapons delivery systems and defenses against ballistic missiles. The talks were indefinitely postponed when, on August 20, the Soviet Union invaded Czechoslovakia (45:133).

As President Nixon took office in 1969 he was faced with a developing controversy over the Sentinel ABM system. Opponents of the system who lived in the proposed deployment areas, particularly Seattle, Chicago, and Boston, were lobbying against the system and bringing national attention to this issue (46:1-37). Nixon decided to revisit this issue as part of a general review of Johnson administration defense policies. The result was to replace Sentinel with a revised and expanded system called Safeguard. Rather than concentrate on area defense of cities, Safeguard would defend the ICBM bases and protect US retaliatory capability. This

new role for the Safeguard system was coupled with a strategy to match the Soviet ABM system and influence them to participate in arms control negotiations (12:172-175). "Throughout diplomatic negotiations, the President viewed the position of negotiation from strength as the essence of our bargaining stance with the Russians" (12:179).

The SALT I talks began in November 1969, and for the next thirty months negotiations centered around the limitation of defensive (ABM) and offensive (ICBM and SLBM) missile systems. Finally, on May 26, 1972 at the summit in Moscow, President Nixon and General Secretary Brezhnev signed the ABM treaty and the Interim Agreement on Offensive Missiles (45:135).

The ABM treaty allowed both sides to have two ABM deployment areas, one to protect its capital and another to protect an ICBM launch area. This was later changed to one ABM site per country at the 1974 Summit meeting. The Soviet Union continued to maintain their ABM system around Moscow, while the US chose to maintain defense of its ICBMs deployed at Grand Forks AFB, North Dakota (45:161). These ABM sites were limited to 100 interceptor missiles and 100 launchers. The launchers were further prohibited from being able to launch missiles with more than one independently guided warhead or be capable of rapid reload (45:137). Other provisions of the treaty dealt with positioning of radars for early warning of attack and the creation of a consultation committee to monitor the implementation of the treaty. To assure compliance, the treaty called for "national technical means of verification", which meant satellite reconnaissance and the monitoring of electronic signals. Finally, the ABM Treaty was of unlimited duration (45:xxxiv).

The Interim Agreement was essentially a freeze on the number of ICBM launchers, either operational or under construction, and permitted an increase in SLBM launchers up to an agreed level. At the time of the signing, the US had 1054 (1000 Minuteman and 54 Titan II) operational ICBMs, and none under construction; while the Soviet Union had an estimated 1618 operational and under construction (45:148). This cap on the number of launchers did not prohibit the qualitative improvement of the missiles within them and thus allowed for multiple independently targeted reentry vehicles (MIRVs) (45:xxxv). The agreement was intended to be in force for five years while both countries continued negotiations for a more comprehensive agreement.

The ABM treaty was approved by the US Senate by a vote of 88-2, but the Interim Agreement was amended prior to Senate approval. Critics of the agreement felt the Soviet

Union was granted superiority over the U.S. and Senator Henry Jackson (D-Wa.) introduced an amendment stipulating that any future arms-control agreement should ". . . not limit the U.S. to levels of intercontinental strategic forces inferior to the limits of the Soviet Union" (45:xxxv). The amendment was approved and served to influence American negotiators on future agreements.

SALT II

The second phase of Strategic Arms Limitation Talks (SALT II) sought to develop qualitative limitations on these weapons. SALT I had limited the number of launchers and this could be verified by satellite reconnaissance, however, they could not determine whether the missiles were equipped with MIRVs. In June 1974, President Nixon visited Moscow and signed a protocol to the ABM Treaty limiting each side to one ABM site. Nixon and Brezhnev also agreed to complete a SALT agreement on both quantitative and qualitative limitations prior to the 1977 expiration date of the Interim Agreement. Unfortunately, upon his return President Nixon found U.S. domestic attention focused on the Watergate incident, and the resulting findings of a Senate investigation forced his resignation from office on August 8, 1974. Subsequently, President Ford embraced the previous Nixon administration arms control initiatives, and he met with Secretary Brezhnev at Vladivostok in November 1974 to renew an arms-control agreement. The two leaders agreed that each country should be limited to 2,400 strategic nuclear delivery vehicles (long-range bombers, ICBMs, and SLBMs) and of this total a maximum of 1,320 could be MIRVed (45:xxxvii).

The terms of the Vladivostok agreement met criticism from both supporters and opponents of SALT. Supporters felt the aggregate number of strategic nuclear vehicles as well as MIRV sub-limits were set too high. The opponents of the agreement were dissatisfied that the agreement did not count the newly deployed Soviet Backfire bomber as a strategic vehicle. Other considerations concerning the cruise missile, the MX and verification were also difficult issues. US domestic politics also played a key role at this time. Ronald Reagan criticized the arms-control policies of the Ford administration and came close to taking the Republican party nomination away from the incumbent president. All of the Democratic candidates attacked the Ford-Kissinger policies toward the Soviet Union and Jimmy Carter won the presidential election in November 1976 (45:xxxviii).

In 1977, the SALT talks took on a distinctively different approach as President Carter indicated a desire to

move toward nuclear disarmament and not simply arms control. Carter proposed a 20 percent reduction in the total of strategic nuclear launch vehicles allowed under the Vladivostok agreement, but this was rejected by the Soviets. Over two years passed before the US and the Soviet Union were finally able to negotiate a SALT II Treaty. It was signed by President Carter and Secretary Brezhnev on June 18, 1979 (45:xxxix). See Appendix B for relevant details of this agreement.

The Senate held hearings on the SALT II agreement during the summer and fall of 1979. Several international events impacted these proceedings and ultimately resulted in the failure of the US Senate to ratify the treaty. First, in August a Soviet "combat brigade" was discovered in Cuba that caused great concern with several Senators. Then, in November, the US Embassy in Tehran, Iran, was taken over and American personnel were held hostage. Although this crisis seemed unrelated to SALT, many Americans concluded the US should not be negotiating a compromise with the Soviet Union. Finally, in December the Soviet Union invaded Afghanistan and President Carter asked the Senate to delay indefinitely consideration of the SALT II Treaty (45:xlii).

START and INF

As the Reagan administration took office in 1981, they were more interested in building up US military forces than in engaging the Soviet Union in arms control negotiations. During the 1980 presidential election Reagan had referred to the SALT II treaty as "fatally flawed" and felt that in the next round of negotiations, the US should bargain from a position of strength. Distinct from the US defense build-up was the continuation of the Carter administration proposed deployment of Pershing II and ground-launched cruise missiles (GLCMs) in Europe starting in 1983. On November 18, 1981, President Reagan proposed a "zero-zero option" whereby if the Soviet Union would dismantle 600 intermediate- and medium-range ballistic missiles, then the US would not deploy its 572 (108 Pershing II and 464 GLCM) missiles in Europe. The Soviets refused and the Administration did not complete any intermediate nuclear forces (INF) agreements (45:xliii).

During 1982 Congress was again pressuring the President to achieve an arms control agreement. Seeking to disassociate himself from the "flawed" SALT process, President Reagan announced a new approach to nuclear arms control called Strategic Arms Reductions Talks (START). These negotiations would focus on lowering the number of ballistic warheads and reducing the number of deployed ballistic

missiles. Both sides proposed force levels that were rejected. The Reagan administration continued to advocate a substantial military build-up as an attempt to influence the Soviet Union to negotiate seriously at START The deployment of MX in the US and INF missiles in Europe became key to this build-up process (45:xliv).

Over the next several years the deployment of these systems became symbolic of the resolve required to successfully negotiate with the Soviet Union. Many of the citizens in the NATO allied countries did not want to deploy the INF missiles. The Reagan administration felt the US must show its resolve by deploying the MX to encourage our NATO allies to accept the INF missiles (8:52-53). Facing opposition in Congress to all proposed MX basing modes, Reagan appointed the Scowcroft Commission to analyze our strategic forces and recommend a basing mode for the MX. Following the commission's report, Reagan pledged he would seek to conclude arms control agreements with the Soviet Union. Accepting this pledge, Congress voted to fund the MX. In December 1983, deployment of INF missiles began in Europe and the world waited to see if these actions would influence the Soviets into concluding an agreement in Geneva (45:xliv).

CONCLUSION

After much political rhetoric and the deployment of INF forces in Europe, there is now a negotiated treaty signed by both heads of state. The US Senate is scheduled to conduct hearings on the treaty in the spring of 1988 and vote on ratification. President Reagan has proposed a START agreement that would reduce by fifty percent the number of land-based ICBMs. While the future remains uncertain, it is the Air Force position that continued ICBM modernization is pivotal to the success of the arms control process (19:38). As President Reagan said during his endorsement of the Scowcroft Commission recommendations:

> Make no mistake: unless we modernize our land-based missile systems, the Soviet Union will have no real reason to negotiate meaningful reductions. If we fail to act, we cannot reasonably expect an acceptable outcome in any arms control negotiation and we will also weaken the deterrent posture that has preserved the peace for more than a generation (47:4).

Chapter Five

PEACEKEEPER AND THE SMALL ICBM: THE EARLY YEARS

INTRODUCTION

The controversy surrounding Peacekeeper and Small ICBM goes back many years. Often when giving The ICBM Modernization Briefing people ask questions on events that occurred many years ago. Some of these significant events in the history of the program that are still relevant today occurred prior to when most briefers came on active duty. However, it is important that the briefer be aware of this history since audiences will naturally assume you are an expert. Your purpose on stage is to inform them, and they will expect you to have the answers.

The purpose of this chapter is to explore some of the relevant early beginnings of the Peacekeeper and Small ICBM program which serve as the foundation of the current ICBM modernization program.

PEACEKEEPER: THE EARLY YEARS, 1971-1983

On 19 November 1971, Headquarters SAC issued the Required Operational Capabilities (ROC) 16-71 for an advanced ICBM, designated "Missile-X" (41:58). This new missile would incorporate advances made in propulsion, warhead performance, and accuracy, and improve our capability to attack hardened targets. It also addressed the technical issue that Minuteman would eventually become obsolete (23:69). As the requirement for the missile was taking shape, special consideration was also focusing on a new basing mode. The subject of different basing modes for ICBMs started in 1965 with a long-range planning study called Strategic Systems X (8:12-13;31:7). The Strat-X study was in response to the Soviet fielding of new ICBMs that threatened our launch control centers. The immediate result of the study was the Airborne Launch Control Center (ALCC) which gave a survivable back-up system that addressed the concerns over not being able to launch the force. Other various engineering concepts had been evolving on ways to have mobile missiles or a combination of mobility and hiding (31:7). Many of these

ideas would be considered and reconsidered over the next twenty years in an attempt to insure ICBM survivability.

On 22 December 1972, "Headquarters USAF directed MX development to start with emphasis on air and ground mobile basing" (41:59). The ABM Treaty had negated the ability that all of the US missile silos could be protected by the 200 interceptors (later changed to 100), so ways to make the new missile mobile or deceptively based were studied. Shortly thereafter in June 1973, the US Air Force established the MX Office at Norton AFB in San Bernardino, CA. Six months later Brigadier General John Hepfer was placed in charge of the program and the new office was renamed the Ballistic Missile Office (BMO) (7:124). To comply with Headquarters USAF direction, the BMO conducted research on an air-mobile and covered trench basing mode. Testing of the airmobile concept was demonstrated in October 1974, when a C-5A cargo aircraft performed an air-launch of a Minuteman I ICBM. The missile was pulled from the aircraft by a parachute and ignited at 8000 feet. It's engines burned for 10 seconds taking it back up to 20,000 feet before it fell back into the Pacific Ocean. This test at the Western Test Range off California demonstrated the capability of an ICBM to ignite in the air (17:20-21;26:75). The covered trench would place missiles underground on tracks where they could move undetected. They would break through the roof of the trench to launch. BMO was considering the Great Basin region of Utah and Nevada as a deployment area (7:127). However, both of these alternatives encountered problems with survivability and involved prohibitively high costs (7:127). For these reasons, the Air Force continued to seek alternative basing modes.

Between 1973-1976 BMO continued to explore various basing modes for MX including retrofitting of MX into Minuteman silos as an interim solution. In 1975, USAF asked Congress to authorize deployment in Minuteman silos. This request was supported by President Ford as a means to begin missile production and have the increased capability operational by the late 1970's (7:130). However, in March 1976, the Defense System Acquisition Review Council (DSARC) stated a preference for the buried trench basing mode for MX (41:63). In July 1976, Congress refused to appropriate funding for the validation of silo-based MX missiles. They were convinced that silo-based ICBMs would be vulnerable to the new generation of Soviet ICBMs. Intent on reducing the budget, Congress also deleted funding for the air-mobile option, and directed that funding be used to validate multiple aim-point (MAP) basing in either the buried trench or shelter basing modes (41:64;7:139).

In 1977, President Carter took office and was skeptical about the need for the MX system. In his inaugural speech he said he was committed to arms reduction and stated his intention to work toward "...ridding the world of nuclear weapons" (31:4). He saw MX as a bargaining chip in the SALT negotiations and wanted to abandon MX in an attempt to induce the Soviet Union to reduce the size of their heavy missile force. When the Soviets rejected his proposal for "deep cuts", he still hoped that MX could be traded for Soviet concessions later during negotiations. But, until that time, work would have to continue on MX to convince the Soviets that the bargaining chip was credible (7:140-141).

The whole question of whether we needed a new ICBM at all developed in 1978. The Soviets had flight tested upgraded versions of the SS-18 and SS-19 and demonstrated accuracies that could destroy our Minuteman silos. This started the great debate over the vulnerability of our ICBM forces and strategies in which we use these weapons as a component of our strategic forces (31:14). The President, Congress, DOD, and the American people all became embroiled over the issue of our defense capability and the arms control process. The MX debate focused the attention of all these groups and spawned several studies of both the missile and possible basing modes (31:14).

In the summer of 1978, President Carter directed a complete evaluation of the Ford administration's previous work on a buried trench basing mode for MX. This resulted in three studies to examine the plans for MX: the White House directed a study by the Office of Science and Technology; OSD assigned the task to the Defense Science Board; and Headquarters Air Force directed a study by the Air Force Systems Command (AFSC) (7:141-142). All told, over 30 basing modes were studied to assess the major advantages, disadvantages, risk, and uncertainties of each (36:--). As a result, the buried trench option was discarded and in its place the Defense Science Board recommended a basing system of vertical multiple protective shelters (MPS). This was a multiple aim-point (MAP) system whereby missiles would be rotated among a number of shelters similar to the "pea-in-the-shell" game. It would require the Soviets to target all of the shelters since they would not know which shelters contained the real missiles. On 5 December 1978, the Defense System Acquisition Review Council (DSARC) II recommended full-scale development of vertical MPS basing for MX; however, Dr. William Perry, Under Secretary of Defense, Research and Engineering, directed a further study of airmobile basing pending a final decision (41:67).

On 31 March 1979, DSARC IIB reviewed the results of the airmobile study and concluded it was feasible but not desirable because of reliance on tactical warning, loss of accuracy, and cost (41:67). The vertical MPS system was refined and changed to a horizontal MPS, or "racetrack", system and recommended to the President. President Carter approved full-scale engineering development (FSED) for the MX missile on 5 June 1979 just prior to his signing of the SALT II Treaty on 18 June. On 7 September 1979, he announced selection of horizontal MPS basing for 200 MX missiles in 4,600 shelters to be deployed in the Great Basin area of Utah and Nevada (31:14).

During the 1980 presidential campaign, Ronald Reagan supported the MX missile but opposed the MPS basing mode of the Carter administration. There was extreme opposition from the western states and several civic groups over the environmental issues surrounding deployment in Utah and Nevada. As President Reagan took office in 1981 another review committee (chaired by Professor Charles Townes, physicist from the University of California) was formed to develop a basing mode for MX (11:254). The Townes panel recommended several possible ways to base the MX including continuous patrol aircraft (CPA), closely spaced hardened silos, and deep underground basing. In addition to these long-range possibilities the committee recommended an interim basing suggestion: ". . . it called for MX deployment to begin in a small number of shelters, designed in such a way that these could be expanded into an MPS system if no other long-range alternative worked out" (11:255). As a result, on 2 October 1981, President Reagan cancelled the horizontal MPS basing scheme for MX and announced plans for a near-term deployment of a limited number of MX missiles in superhardened Titan II or Minuteman silos. He also ordered further research and development on deep basing, CPA, and ballistic missile defense (41:70).

The results of the Townes Panel did not resolve the issue, rather it served to "add fuel to the fire." Media attention to the issue increased and the administration and the Air Force were unable to agree on a suitable course of deployment. On 30 December 1981, Secretary of Defense Weinberger, announced the Administration proposed to deploy 40 missiles in Minuteman only silos at F.E. Warren AFB, Wyoming, as an interim measure while research and development continued on more permanent basing modes (41:70). However, in April 1982, Congress disapproved the interim basing idea and in the Fiscal Year 83 Defense Authorization Act required the President to make a permanent basing mode decision by 1 December 1982 (41:71).

In the next attempt to find the elusive basing mode for the missile, the Air Force and the Administration decided to pursue an option that had been considered by the Townes panel. Closely Spaced Basing (CSB), or "Dense Pack", called for deploying missiles in a tightly grouped cluster of super hard silos (11:257-259). A second Townes Panel was reformed to assess the technical feasibility for MX basing. The Townes Panel gave tentative approval (since the concept was based on the highly controversial effects of "fratricide") to CSB deployment and the Administration proposed it to Congress on 22 November, 1982. In his decision statement to the Congress and released to the media, President Reagan related that ". . . [We] plan to produce the MX missile, now named Peacekeeper, and deploy it in superhard silos at F.E. Warren AFB, Wyoming" (41:71). On 7 December 1982, Congress defeated the proposal and withheld further funding of the program until approval was obtained in voting by "both Houses of Congress in concurrent resolution" (11:258;38:--). The legislation also directed the President to report back to Congress not earlier than 1 March 1983 on strategic and arms control questions (7:228).

Following the defeat of Dense Pack, many people felt the MX program was near termination. The President, Congress, and DoD seemed deadlocked in disagreement and the credibility of the program was at an all time low. The Air Force had declared each new basing mode as better than the last one but failed to convince a majority of lawmakers. The media referred to the process as the "basing mode of the month". Despite the Dense Pack debacle, some Congressmen still supported the MX missile and felt it was necessary to achieve progress in arms control negotiations. Others wanted to abandon MX and pursue a smaller, single warhead ICBM. It was clear that a political solution was necessary to solve the issue (7:215-229;11:256-259).

To comply with Congressional direction, on 3 January 1983, President Reagan empaneled the President's Commission on Strategic Forces. This bipartisan group was chaired by Lieutenant General Brent Scowcroft (USAF, ret.), who had been President Ford's national security advisor. They were tasked to review the entire strategic modernization program; and in particular, to examine the future of our ICBM forces and to recommend basing alternatives. Another key principle of their charter was to consult closely with members of Congress (39:--). The Scowcroft Commission recognized that ". . . by trying to solve all ICBM tasks with a single weapon and a single basing mode, . . . we have made the problem of modernizing the ICBM force so complex as to be virtually

insoluble" (37:14). On 11 April 1983, the Scowcroft Commission announced their results and made the following recommendations with regard to ICBMs:

> a. Engineering design should be initiated, now, of a single-warhead ICBM weighing about fifteen tons; this program should lead to the initiation of full-scale development in 1987 and an initial operating capability in the early 1990s. Deploying such a missile in more than one mode would serve stability. Hardened silos or shelters and hardened mobile launchers should be investigated.
>
> b. One hundred MX missiles should be deployed promptly in existing Minuteman silos as a replacement for those 100 Minuteman and the Titan II ICBMs now being decommissioned and as a modernization of the force.
>
> c. A specific program to resolve the uncertainties regarding silo or shelter hardness should be undertaken, leading to later decisions about hardening MX in silos and deploying a small single-warhead ICBM in hardened silos or shelters. Vigorous investigation should proceed on different types of land-based vehicles and launchers, including particularly hardened vehicles (37:21).

The recommendations of the Scowcroft Commission were noteworthy for several reasons. Working with key members of Congress, they developed a package intended to solve the MX basing mode problem and forge a consensus that would be politically acceptable. First, the deployment of 100 MX in existing Minuteman silos to improve US capability to place at risk Soviet hardened targets. Secondly, the development of a single warhead missile to shift away from MIRVed ICBMs and improve survivability through hardening and/or mobility. Third, to tie both of these programs to the arms control process and work toward reducing overall force levels. The Commission findings were to be treated as an integrated package to link ICBM modernization to arms control and be a compromise that could obtain bi-partisan support. On 19 April 1983, President Reagan endorsed the commission's recommendations and set about to seek Congressional approval (7:229-234; 11:259-263).

The Scowcroft Commission recommendations were debated throughout the summer and fall of 1983. Various factions in

the House and Senate supported parts of the Scowcroft package but it was uncertain whether total acceptance could be obtained (11:263-264). On 20 July 1983, the House narrowly agreed (220-207) to authorize funding for MX procurement. Amendments were considered that indicated significant progress in START would have to occur for final Appropriation approval in the fall (7:239). On 26 July 1983, the Senate agreed (58-41) to authorize funding for MX (7:241). However, the summer of 1983 saw no movement in START talks and anti-MX forces felt the system would be defeated in the upcoming Appropriation votes.

Then, a series of international events occurred which may have contributed to saving the program. On 1 September 1983, the Soviet Union shot down South Korean passenger jet, KAL 007, killing all 269 people aboard including a member of Congress, Rep. Larry McDonald, D-Ga. (7:241;29:5A). This coupled with the attack by truck bomb on the US Marine headquarters in Beirut and the US military action in Grenada may have served to create a wave of support for pro-defense issues (7:241-242;11:265).

On 4 October 1983, President Reagan announced a new START proposal including a "build-down" proposal and receded from his previous insistence on drastic reductions in the Soviet ICBM force (7:242). On 1 and 7 November 1983, the House and Senate approved an Appropriation bill funding procurement of MX missiles and approving research and development funds for Small ICBM.

CONCLUSION

The Scowcroft Commission findings served to give new direction to the ICBM modernization program that had been embroiled in controversy for over a decade.

> Phoenix-like, the MX had survived four presidential administrations, thirty different basing modes, legal threats, popular demonstrations, legislative obstacles, and multiple lobbying pressures. Still there was no guarantee that the program would survive the annual scrutiny that Congress would execute during the authorization and appropriation battles in the years to come (7:242).

The ICBM modernization program would face many battles in the next few years as both the Peacekeeper and Small ICBM continued to vie for acceptance and compete for funding. At

this time, the "new" ICBM Modernization Briefing was developed and served to articulate SAC requirements to the public.

Chapter Six

THE CURRENT GAME PLAN

INTRODUCTION

Chapter Five reviewed the early years of the Peacekeeper program and the final consensus for ICBM modernization provided by the Scowcroft Commission Report. This report provided the game plan for continuation of the ICBM modernization program, including identifying a basing mode for Peacekeeper and proposing development of a small, single-warhead ICBM. A form of this consensus still provides the basis for today's ICBM modernization program.

Unfortunately, the consensus has undergone some modification since April 1985 when the Senate capped basing of Peacekeeper in Minuteman silos to fifty missiles. This forced the Office of the Secretary of Defense back to the drawing board to find a basing mode for the second fifty Peacekeeper missiles. The exhaustive effort which followed culminated in a Presidential decision, announced on 19 December 1986, to begin research and development on a Rail Garrison basing mode for Peacekeeper and to enter full-scale development of the Small ICBM in Hard Mobile Launchers (48:--). During this time period, Headquarters SAC Directorate of ICBM Requirements action officers were involved in every phase of bringing these programs on line. The authors, and others, helped coordinate the efforts of the Air Staff, AFLC, AFSC, SAC, and other DOD and contractor agencies in developing system requirements and operations concepts.

The purpose of this chapter is to review the activities which took place between the time period when the Senate capped Peacekeeper deployment in Minuteman silos and the Presidential announcement. The chapter will focus on the rationale for the Rail Garrison basing mode for Peacekeeper and the rationale for the Small ICBM program based in Hard Mobile Launchers.

SEARCHING FOR A PEACEKEEPER BASING MODE

The Peacekeeper military requirement has always focused on the need for an advanced ICBM capable of addressing the imbalance in countermilitary capability between the United States and the Soviet Union. The military requirement for the missile itself is generally well understood, although not universally accepted. However, the missile has progressed well despite controversy over the basing mode.

When the Scowcroft Commission Report was approved by both President Reagan and the Congress, BMO and SAC pursued vigorously a program to base Peacekeeper missiles in Minuteman silos. In June 1983, just two months after the Scowcroft Commission tendered their report, the first Peacekeeper flight test was successfully conducted and signalled the way for the most successful ICBM flight test program in the history of the Air Force (16:60). This research and development flight test program was designed to demonstrate the capability of the new Peacekeeper missile and reduce the acquisition risks before subsequent operational deployment (42:2;52:3).

By April 1985, eight flight tests of the Peacekeeper missile had been successfully conducted, thereby proving the capability of the missile. However, the Senate was still uneasy about the wisdom of basing 100 Peacekeeper missiles in what they considered to be a vulnerable basing mode. Despite the Scowcroft Commission logic to rapidly deploy Peacekeeper to address the countermilitary shortfall and to begin research and development on a small, single warhead ICBM to address long-term survivability concerns, on 4 April 1985, the full Senate voted to restrict (i.e., "cap") Peacekeeper basing in Minuteman silos at fifty missiles. The Nunn-Warner Amendment language stated, "Unless a different basing mode is proposed by the President and agreed to by the Congress, no more than fifty Peacekeepers can be deployed in existing Minuteman silos" (51:--). Therefore, the Peacekeeper program was back in the search for a basing mode again. It was generally felt that this was the final opportunity to settle the basing question once and for all, or else lose the second fifty Peacekeepers (authors' experience).

Responding to Congressional direction, Secretary of Defense Caspar W. Weinberger directed the Air Force to begin studying alternate basing modes. This culminated in a tasking from the Air Staff to AFSC and SAC in July 1985 to begin conceptual studies of seven candidate basing modes: rail mobile, superhard shelters (with and without deception), mobile encapsulated hardness ("carry hard"), shallow tunnel ("hard trench"), hardened Minuteman silos, ground mobile

launcher, and deep underground basing. The SECDEF asked for a basing report by 1 November 1985 to be presented to the Joint Requirements and Management Board (JRMB), which had replaced the Defense Systems Acquisition Review Council (DSARC) in June 1985. This presentation would narrow the focus of the study for a recommendation to the SECDEF "to support incorporation of funding in the Fiscal Year 1987 President's Budget for potential full scale development of a Peacekeeper follow-on basing mode for the second fifty Peacekeeper missiles" (51:--).

Thus began a 15-month effort to narrow the candidate basing modes from the initial seven down to four final competitors (rail mobile, carry hard, shallow tunnel, and superhard silos), culminating in the Presidential decision to enter research and development to base Peacekeeper in rail garrison. It was a long and grueling reassessment of some basing modes that had been studied and restudied over the past three decades. A combined BMO, SAC, and contractor effort produced volumes of data on each of the candidate basing modes. An interim JRMB review eliminated three of the candidate basing modes: deep underground basing, hardened Minuteman silos, and ground mobile launcher. Deep underground was eliminated because it could not provide a prompt launch capability. Ground mobile launcher had been previously studied and determined not feasible since it would be a tremendously large and heavy (approximately 1 million pounds) and extremely slow (maximum speed of about 15 miles per hour). Hardened Minuteman silos was eliminated because it was not cost effective and did not offer any significant advantages (authors' experience).

In August 1986, the Air Force began looking at variants of the rail mobile basing mode. The Soviets had begun basing their SS-X-24 in a rail mobile mode (28:62), and SAC wanted to look at a similar type of basing mode for Peacekeeper. Rail garrison became the preferred basing mode. The rationale for this support was that the recommended basing mode had to respond to the Congressional mandate for mobility and deception, or else the Air Force would lose the second fifty missiles. Rail Garrison was the only one of the four surviving candidates that truly possessed mobility. As a result, once again BMO and SAC were thrust into the breach to develop an operations concept for a rail garrison basing mode (authors' experience).

The joint Air Staff, BMO, and SAC presentation to the JRMB in November 1986 culminated in a recommendation to the SECDEF to base the remaining fifty Peacekeeper missiles in the rail garrison basing mode. SECDEF subsequently agreed

and forwarded this recommendation to President Reagan for approval. The Presidential decision was announced on 19 December 1986 (48:--).

PEACEKEEPER RAIL GARRISON

The initial SAC and BMO concept envisioned fifty missiles on twenty-five trains (two missiles per train, each on a separate launch car), parked inside special shelters ("igloos") on existing Air Force bases in a secure "garrison" (similar to a bomber alert area) (17:67;30:72-73). These missiles would be on continuous alert in garrison, retaining full launch capability, during states of normal readiness; however, in times of crisis they could disperse onto the commercial railroad network for improved survivability (16:60).

The rail garrison concept answered two significant concerns about public safety and public interface expressed against rail mobility that had been stated since the first Operation "Big Star" test of mobile Minuteman missiles in the 1960s (36:7). Rail garrison does not require continuous mobility on the nation's rail network. The rail garrison basing mode places missile trains on existing Air Force bases and only disperses in times of national crisis. Therefore, the public concern about nuclear missiles traveling through their communities during peacetime could be resolved, except in times of crisis when national security considerations have higher priority (20:40).

Rail Garrison basing has three attractive features. First, it contributes significantly to deterrence. Rail Garrison provides continuous prompt, retaliatory launch capability both while in garrison and when dispersed. For the first time, the ICBM force can exhibit a show-of-force capability. As world tensions increase, the Peacekeeper trains could be dispersed onto the rail network for survivability and could be recalled if tensions relaxed. During this period, the missiles on the trains would remain fully launch capable regardless of their location. This mobility would provide a high degree of survivability against the current and future threats posed against Peacekeeper (28:60-63).

A second feature of the rail garrison basing mode is that it involves low technical risk and relatively low cost compared to other candidate basing modes (30:73). The Rail Garrison mode will use the already developed Peacekeeper missile, which has proven itself successful through the flight test program. The missile will not require any

significant modifications since it will remain in a canisterized launch configuration on-board a missile launch car. The American rail industry has a tremendous amount of information and technology already developed to support modification of a launch car to support the canisterized missile. Furthermore, this will keep the overall cost down since the Air Force proposes to use existing Air Force bases and the commercial railroad infrastructure. This will eliminate the need to build new bases and there will not be a dedicated military rail network (30:73).

The third, and perhaps most important, feature of the Rail Garrison basing mode is that it is a straight forward concept that can be easily understood (17:67). This is in sharp contrast to previous basing modes, such as the closely spaced basing mode which required an understanding of the effects of fratricide and nuclear dynamics for adequate comprehension, and the multiple protective shelters basing mode which relied very heavily on preservation of location uncertainty. These concepts were very difficult to comprehend for the average military officer and member of Congress (7:226). Rail garrison basing, on the other hand, uses existing Air Force bases, existing railroad procedures, and keeps the trains parked on Air Force bases day-to-day out of the public domain.

Furthermore, Peacekeeper based in Rail Garrison supports stability. The Soviets cannot be assured of successfully disarming the United States with a first strike attack. Mobility provides a doubt in the mind of the Soviet planner about his probability of success. "By increasing the Soviet's risk to attack the United States, deterrence, stability, and national security interests are served" (43:2-4). This is now, finally, a basing mode that complies with Congressional emphasis on survivability and stability. Congress all along had been concerned that fixed-aim-point missile systems were destabilizing because they invited first strike and forced the United States into a "use them or lose them" position (28:61). Peacekeeper in Rail Garrison also argues against the position that the Peacekeeper is a first strike weapon. Although US national policy dictates against first use of nuclear weapons, the mobility of the rail garrison basing mode precludes the necessity of using them or losing them.

THE SMALL ICBM

As noted in Chapter Five, the President's Commission on Strategic Forces recommended that the Air Force develop a small, single reentry vehicle ICBM.

> The underlying logic for this recommendation was that a Small ICBM would be very flexible in terms of basing and therefore potentially more survivable than current systems. A Small ICBM with a single reentry vehicle would present a relatively low-value target and an attacker could not expect a favorable exchange ratio between reentry vehicles expended and destroyed. Therefore, a Small ICBM would be stabilizing and enhance the arms control process (35:13).

Shortly after the Scowcroft Commission tendered its report to the President, in July 1983 the Air Force Systems Command established a Small ICBM Independent Advisory Group, chaired by General Bernard Schriever (USAF, Ret.), "to provide the best acquisition strategy and management approach for the Small ICBM program" (44:1). The report recommended guidelines for the baseline Small ICBM program which essentially called for a program consistent with Congressional emphasis as specified in the Glenn Amendment to the Fiscal Year 1984 Defense Authorization Bill, which stated:

> It is the sense of the Congress that the design, development, and testing of small, mobile, single warhead, ICBMs be pursued as a matter of the highest national priority. . . program emphasis should be consistent with top national priorities such as Polaris, Minuteman, and Apollo, and program management structure should also reflect such priority (44:2).

The Advisory Group also endorsed the Glenn Amendment's target date for an Initial Operational Capability for ten Small ICBMs on alert by 1992. The Advisory Group also advised deployment in hard mobile launchers, but recommended continued research and development of hard silo basing as a potential second basing mode for the Small ICBM (44:2). The baseline program shares considerable technology from the Peacekeeper program, namely the lightweight version of the AIRS guidance system, booster technology, reentry vehicle (MK 21), and Command and control technology (44:1).

The Small ICBM program is a complement to the Peacekeeper system. These complementary systems are needed to address the issues of prompt countermilitary shortfall and survivability/stability. The Small ICBM contributes in this arena by providing wide dispersal and trying to attack Small ICBM would cause an unfavorable exchange ratio to the Soviets. "Charging the Soviets an exorbitant price would certainly discourage such an attack, to the benefit of deterrence and stability" (14:40).

Small ICBM demonstrates U.S. resolve to modernize our ICBM force and provide the leverage needed to negotiate arms control agreements from a position of strength. For the future, the Small ICBM will improve war planning efficiency, offer the features of high survivability, add to enduring deterrence and retain the accuracy and responsiveness of land-based ICBMs. The Air Force is committed to both programs (43:2-6).

CONCLUSION

The ICBM modernization program is once again at the center of controversy within the Department of Defense and on Capitol Hill. While the current game plan is designed to enhance our deterrent capability and respond to the mandates of Congress, the task of advocating its continuation has never been more difficult. Anticipated cuts in defense expenditures over the next five years may seriously impact the deployment of Peacekeeper Rail Garrison or Small ICBM (18:--). It is imperative that ICBM modernization briefers keep current on the issues and give clear and credible presentations when advocating requirements to the public. This handbook was developed to assist you in the process and broaden your knowledge of the ICBM modernization program. Good luck!

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APPENDICES

Appendix A--List and Brief Description of Peacekeeper Candidate Basing Modes

Appendix B--Provisions of the SALT II Treaty

Appendix C--Members of the Scowcroft Commission

Appendix D--Members of the Small Missile Independent Advisory Group (Schriever Commission)

APPENDIX A

LIST AND BRIEF DESCRIPTION OF PEACEKEEPER CANDIDATE BASING MODES

OSD REPORT OF DECEMBER 1980 (36:5-8)

1. Commercial Rail:
   - Special trains move ICBMs over existing commercial railroads
   - Trains move randomly and park to launch

2. Covered Trench:
   - Unmanned transporter/launcher travels randomly in a trench that is covered with a concealing fabric

3. Dash to Shelter:
   - Missiles on transporters at center of radial road or rail network
   - Dash to hardened horizontal shelters on warning

4. Dedicated Rail:
   - Build new automated railway for nuclear hardened trains carrying missiles
   - Trains move randomly and launch on command

5. Dirigible:
   - Carry ICBMs on fleet of dirigibles operating in a continuous airborne mode over oceans
   - Launch missiles from dirigible

6. Ground Effect Machine (GEM):
   - Scatter fleet of GEM transporter/launchers over large uninhabited areas of southwest U.S.

7. Hard Rock Silo:
   - Build silos in granite outcroppings in western U.S.
   - Design goal is to achieve highest possible hardness with surface-flush silo launchers

8. Hard Tunnel:
   - Store missiles in very deep, superhard tunnels which can withstand direct hits
   - Automatic dig-out and launch on command

9. Hybrid Trench:
   - Shallow buried tunnels with M-X missiles on unmanned transporter
   - Transporter randomly moves to locations in tunnel that have been selectively hardened

10. Hydra:
   - Scatter missiles in the ocean on strategic warning from ships or submarines
   - Water-proof missiles float unattended until commanded to launch, or recovered

11. Minuteman/Multiple Protective Shelters (MPS):
   - Construct additional vertical silos in existing Minuteman silo fields
   - Use Minuteman or new missile that is randomly shuffled between silos

12. Mobile Front End:
   - Build thousands of silos with a missile booster in each
   - Randomly mate a lesser number of expensive front ends (reentry vehicles, guidance system) to missiles
   - Conceal location of complete missile

13. M-X in Multiple Protective Shelters(MPS):
   - 200 missiles concealed among 4600 hardened horizontal shelters
   - Decoys simulate missile/launchers in "empty" shelters

14. Off-Road Mobile:
   - Scatter fleet of off-road mobile transporter/launchers over large uninhabited areas of Southwest US

15. Orbital Based:
   - New booster in Minuteman silos
   - On warning, launch weapons into orbit
   - On command, de-orbit to attack or recover

16. Orca:
   - Anchor encapsulated missiles to offshore sea bed

17. Pool:
    - Shelters are pools of opaque water
    - Transporter deposits water-tight encapsulated missile in pools
    - Operational concept similar to M-X/MPS

18. Road Mobile (New Missile):
    - Parked on military bases, new ICBMs on transporter/launchers wait for attack warning
    - On command, transporter convoys move out over interstate highways and secondary roads

19. Sandy Silo:
    - Bury encapsulated missile in 2000-foot-deep hole and cover with sand
    - Designed to survive direct hit
    - On command, pressurized water fluidizes sand and capsule floats to surface for launch

20. Sea Sitter:
    - Large amphibian aircraft carries ICBMs
    - Plane flies over ocean, landing randomly for extended periods of time

21. Shallow Underwater Missile:
    - Fasten two or more M-X encapsulated missiles to submarines that patrol off US coast

22. Ship-Inland:
    - Carry canisterized missiles on barges that move continuously along inland and coastal waterways

23. Ship-Ocean:
    - Carry missiles on special vessels moving randomly on oceans

24. Short Takeoff and Landing (STOL):
    - Launch missiles from STOL type aircraft
    - Can access numerous landing sites with STOL capability
    - Aircraft operate on ground alert like bombers

25. South Side Basing:
- Base missiles in horizontal shelters or vertical silos at the foot of south-facing mesa or mountain cliff
- Mountain/mesa shields missile from Soviet ICBM attack arriving from north

26. Vertical Takeoff and Landing (VTOL):
- Launch small missile (single R/V) from VTOL aircraft
- Aircraft operate on ground alert from numerous sites and have a "land anywhere" capability

27. Wide Body Jet (WBJ):
- Launch missiles from C-5 or 747 class aircraft
- Aircraft operate on ground alert like bombers
- Option for continuous airborne operations

ADDITIONAL CONSIDERATIONS

28. Launch Under Attack (LUA):
- Launch Minuteman force when early warning systems assess attack in progress

29. Midgetman:
- Build several thousand small, hardened silos and fill each with a small ICBM

30. Road Mobile (Minuteman):
- Use existing Minuteman on road mobile transporter/launchers
- Base at existing Minuteman bases

APPENDIX B

PROVISIONS OF THE SALT II TREATY (45:242-243)

- An equal aggregate limit on the number of strategic nuclear delivery vehicles--ICBM and SLBM launchers, heavy bombers, and air-to-surface ballistic missiles (ASBMs). Initially, this ceiling would been 2,400 as agreed at Vladivostok. The ceiling would have been lowered to 2,250 at the end of 1981;

- An equal aggregate limit of 1,320 on the total number of launchers of MIRVed ballistic missiles and heavy bombers with long-range cruise missiles;

- An equal aggregate limit of 1,200 on the total number of launchers of MIRVed ballistic missiles; and

- An equal aggregate limit of 820 on launchers of MIRVed ICBMs.

- A ban on construction of additional fixed ICBM launchers, and on increases in the number of fixed heavy ICBM launchers;

- A ban on heavy mobile ICBM launchers, and on launchers of heavy SLBMs and ASBMs;

- A ban on flight-testing or deployment of new types of ICBMs, with an exception of one new type of light ICBM for each side;

- A ban on increasing the numbers of warheads on existing types of ICBMs, and a limit of 10 warheads on the one new type of ICBM permitted to each Party, a limit of 14 warheads on SLBMs, and 10 warheads on ASBMs. The number of long-range cruise missiles per heavy bomber would have been limited to an average of 28; and the number of long-range cruise missiles per heavy bomber of existing types would have been limited to 20;

- Ceilings on the launch weight and throw weight of strategic ballistic missiles and a ban on the conversion of light ICBM launchers to launchers of heavy ICBMs;

- A ban on the Soviet SS-16 ICBM;

- A ban on rapid reload ICBM systems;

- A ban on certain new types of strategic offensive systems which were technologically feasible, but which had not yet been deployed. Such systems included long-range ballistic missiles on surface ships, and ballistic and cruise missiles launchers on the seabeds;

- Advance notification of certain ICBM test launches; and

- An agreed data base for systems included in various SALT-limited categories.

APPENDIX C

MEMBERS OF THE SCOWCROFT COMMISSION (39:--)

Brent Scowcroft, Chairman
Nicholas F. Brady
William Clements
John M. Deutch
Alexander M. Haig, Jr.
Richard Helms
John H. Lyons
William J. Perry
Thomas C. Reed
Levering Smith
R. James Woolsey

SENIOR COUNSELORS TO THE COMMISSION

Harold Brown
Lloyd N. Cutler
Henry A. Kissinger
Melvin R. Laird
John McCone
Donald H. Rumsfeld
James R. Schlesinger

EXECUTIVE SECRETARY

Marvin C. Atkins

APPENDIX D

MEMBERS OF THE SCHRIEVER GROUP (44:iii)

Bernard A. Schriever, Chairman
Robert R. Everett, Vice Chairman
Benjamin N. Bellis
William J. Evans
Abner B. Martin
John L. McLucas
Allen E. Puckett
James H. Stewart

SPECIAL ADVISOR

William J. Perry

AIR FORCE SYSTEMS COMMAND REPRESENTATIVE

Melvin F. Chubb, Jr., Major General, USAF

EXECUTIVE SECRETARY

Richard L. Shearer, Jr., Colonel, USAF